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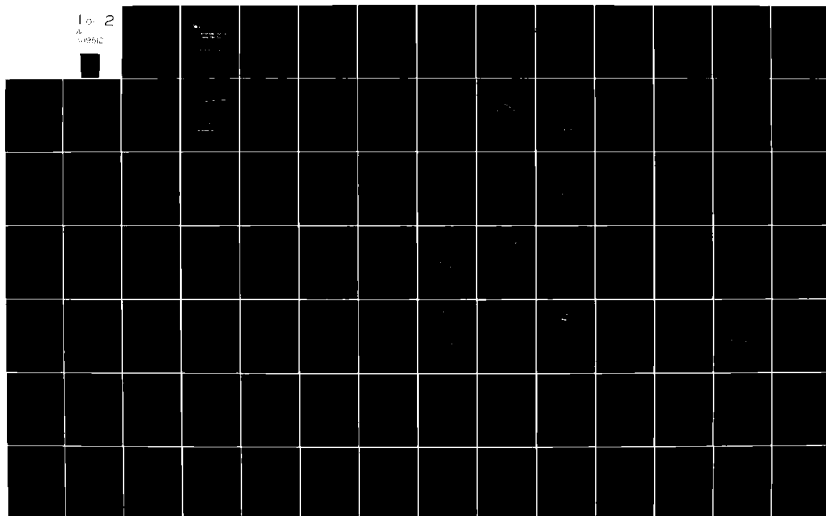
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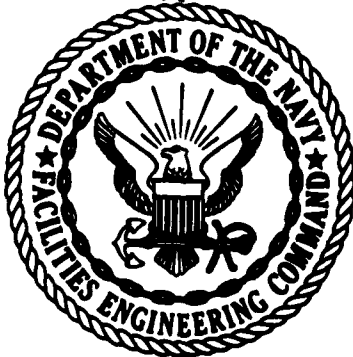


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NOVEMBER 1981

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DRYDOCKING FACILITIES CHARACTERISTICS

DESIGN MANUAL 29.3

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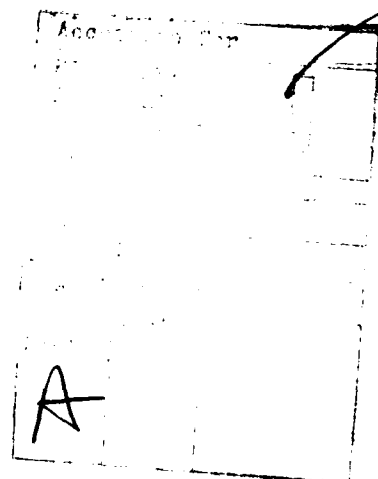
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ABSTRACT

Navy drydocking facilities include graving drydocks, marine railways and marine lifts. Presented are the principal dimensions and characteristics of these drydocking facilities and plans indicating their locations in naval shipyards or other naval shore installations.



29.3-111



FOREWORD

This design manual is one of a series developed from an evaluation of facilities in the shore establishment, from surveys of the availability of new materials and construction methods, and from selection of the best design practices of the Naval Facilities Engineering Command, other Government agencies, and the private sector. This manual uses, to the maximum extent feasible, national professional society, association, and institute standards in accordance with NAVFACENGCOM policy. Deviations from these criteria should not be made without prior approval of NAVFACENGCOM Headquarters (Code 04).

Design cannot remain static any more than can the naval functions it serves or the technologies it uses. Accordingly, recommendations for improvement are encouraged from within the Navy and from the private sector and should be furnished to NAVFACENGCOM Headquarters (Code 04). As the design manuals are revised, they are being restructured. A chapter or a combination of chapters will be issued as a separate design manual for ready reference to specific criteria.

This publication is certified as an official publication of the Naval Facilities Engineering Command and has been reviewed and approved in accordance with SECNAVINST 5600.16.



W. M. TOBEL
Rear Admiral, CEC, U. S. Navy
Commander
Naval Facilities Engineering Command

DRYDOCKING FACILITIES DESIGN MANUALS

<u>DM Number</u>	<u>Chapters superseded in DM-29</u>	<u>Title</u>
29.1	1 through 9	Graving Drydocks
29.2	10	Marine Railways
29.3	11	Drydocking Facilities Characteristics

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DRYDOCKING FACILITIES CHARACTERISTICS

Section 1. INTRODUCTION

1. SCOPE. This manual presents drydocking facilities characteristics in tabular and figure form for graving drydocks, marine railways and lifts. Plans are also presented indicating the locations of drydocking facilities in naval shipyards or other naval shore installations.
2. CANCELLATION. This manual, Drydocking Facilities Characteristics, NAVFAC DM-29.3, cancels and supersedes Chapter Eleven, NAVFAC DM-29, Drydocking Facilities, of February, 1974.
3. RELATED CRITERIA. For criteria related to drydocking facilities characteristics appearing elsewhere in the Design Manual series, see the following sources:

<u>Subject</u>	<u>Source</u>
Graving Drydocks	NAVFAC DM-29.1
Marine Railways.	NAVFAC DM-29.2

Section 2. FACILITIES CHARACTERISTICS SUMMARY

1. TABULAR DATA. Table 1 beginning on page 29.3-3 presents graving drydock, marine railway and lift general locations, facility number designation, size, depth of water, tide range, and types of vessels suitable for docking. These data indicate the range of drydocking facilities existing in the Naval Shore Establishment for planning of drydocking operations. Several of the tabulated facilities are currently leased or on inactive status, but in most instances, they may be reactivated upon short notice.

Section 3. FACILITIES LOCATIONS AND GENERAL DATA

1. FIGURE DATA. Figures 1 through 70 beginning on page 29.3-7 present graving drydock, marine railway and lift specific locations in the Naval Shore Establishment. Each facility is defined by a location plan, longitudinal section, and typical cross-section with limited design, construction and foundation information, and key dimensions. General data are given for each drydocking facility.

a. Graving Drydocks. Data includes the date of construction, type of entrance closure, dewatering and flooding system, power capstans, portal cranes, and ship and industrial services furnished at the dock.

b. Marine Railways. Data includes the date of construction, rated capacity, groundways and cradle description, hauling mechanism, portal cranes, and ship and industrial services furnished at the railway.

c. Marine Lifts. Data includes the date of construction, rated capacity, lift type, capacity of hoists, description of cradle, lift platform and transfer systems, and the ship, industrial and crane services available at the lift.

2. DATA LIMITATIONS. Ship and industrial services described are built-in permanent types. Portable components are often available to supplement quantities to suit peak demands or special requirements. For detailed information on structures, outfitting equipment, and service systems, refer to Naval Facilities Engineering Command (NAVFAC).

TABLE 1
Drydocks Characteristics Summary
Graving Drydocks

LOCATION	DOCK NO.	SIZE & WATER DEPTH				MEAN TIDE RANGE	SUITABLE FOR DOCKING
		Width (at top of coping)	Length (from head end coping to caisson face)	Depth (over sill at MHW)	Superflood (above MHW)		
Bangor, WA TRIDENT	-	90' 0"	715' 6"	53' 0"	4' 0"	10.0'	SSBN.
Bayonne, NJ MOT	7	155' 0"	1,092' 0"	47' 0"	...	4.5'	CV. (Leased)
Charleston, SC NSY	1	134' 0"	622' 0"	34' 5"	5' 5"	5.6'	CGN, AS, SSBN.
	2	114' 0"	596' 6"	37' 6"	3' 5"	5.6'	CGN, AS, SSBN.
	3	107' 4"	365' 10"	10' 7"	...	5.6'	Service Craft.
	4	107' 4"	365' 10"	10' 7"	...	5.6'	Service Craft.
	5	140' 0"	751' 4 3/4"	37' 0"	2' 5"	5.6'	CGN, AS, SSBN.
Hunters Point, CA NSY	2	122' 0"	743' 5"	28' 10"	...	4.9'	CG. (Leased)
	3	153' 0"	1,005' 4 1/8"	39' 10 1/4"	...	4.9'	CV. (Leased)
	4	171' 0"	1,092' 0"	50' 5"	...	4.9'	CV. (Leased)
	5	66' 0"	420' 0"	27' 0"	...	4.9'	DD, SS. (Leased)
	6	81' 0"	420' 0"	27' 0"	...	4.9'	DD, SS. (Leased)
	7	66' 0"	420' 0"	27' 0"	...	4.9'	DD, SS. (Leased)
	1	155' 0"	1,093' 6"	44' 3 3/8"	...	4.7'	CV.
Long Beach, CA NSY	2	104' 0"	687' 6"	37' 1 1/8"	...	4.7'	CG.
	3	104' 0"	687' 6"	36' 0 3/8"	...	4.7'	CG.
	1	122' 0"	525' 0"	35' 9"	3' 3"	4.8'	SSBN.
Mare Island, CA NSY	2	120' 0"	741' 0 3/8"	31' 2"	...	4.8'	CGN, SSBN.
	3	114' 0"	693' 4"	35' 9"	...	4.8'	CGN, SSBN.
	4	104' 0"	435' 8"	22' 8"	...	4.8'	DD, SSN.
	1	86' 3 1/2"	325' 4"	25' 8"	...	2.8'	Service Craft.
Norfolk, VA NSY	2	106' 10"	496' 8"	37' 4 3/8"	6' 4"	2.8'	DD, SSBN.
	3	128' 0"	726' 0"	34' 7"	6' 4"	2.8'	CGN, SSBN.
	4	144' 0"	1,010' 6 1/2"	44' 2"	...	2.8'	CV.
	6	76' 8"	459' 0"	20' 5"	...	2.8'	Service Craft.
	7	76' 8"	459' 0"	20' 5"	...	2.8'	Service Craft.
	8	150' 0"	1,092' 5"	47' 11"	...	2.8'	CVN.
	1	106' 10"	496' 8"	37' 4 3/8"	6' 4"	2.8'	DD, SSBN.
	3	128' 0"	726' 0"	34' 7"	6' 4"	2.8'	CGN, SSBN.

TABLE 1 (Continued)
Drydocks Characteristics Summary
Graving Drydocks (Continued)

LOCATION	DOCK NO.	SIZE & WATER DEPTH				MEAN TIDE RANGE	SUITABLE FOR DOCKING
		Width (at top of coping)	Length (from head end coping to caisson face)	Depth (over sill at MHW)	Superflood (above MHW)		
Pearl Harbor, HI NSY	1	138' 0"	1,002' 5"	35' 0"	5' 0"	1.5'	CVA.
	2	147' 0"	1,000 5 $\frac{7}{8}$ "	46' 6"	...	1.5'	CVA.
	3	104' 0"	497' 6"	23' 0"	6' 0"	1.5'	DD, SSBN.
	4	155' 0"	1,088' 6"	48' 6"	...	1.5'	CVN.
Philadelphia, PA NSY	1	94' 6"	442' 0"	27' 7"	...	5.6'	DD, SS.
	2	140' 2 $\frac{3}{4}$ "	744' 6 $\frac{7}{8}$ "	30' 0 $\frac{1}{8}$ "	...	5.6'	CA.
	3	144' 0"	1,011' 4"	43' 5"	...	5.6'	CVS, CG.
	4	150' 0"	1,092' 0"	40' 0"	...	5.6'	CV.
	5	150' 0"	1,092' 6"	43' 6"	...	5.6'	CV.
Portsmouth, NH NSY	1	104' 0"	435' 3"	25' 0"	...	8.0'	SSN.
	2	129' 0"	686' 5"	30' 4"	2' 8"	8.0'	SSBN.
	3	71' 0"	486' 0"	37' 0"	3' 8"	8.0'	SSBN.
Puget Sound, WA NSY	1	108' 0"	638' 11"	30' 2"	5' 4"	8.0'	CG, SSBN.
	2	145' 0"	867' 0"	38' 2"	...	8.0'	CVA, CVS, SSBN.
	2	130' 0"	926' 8"	23' 8"	...	8.0'	DD, SS.
	4	147' 0"	997' 10"	45' 2"	...	8.0'	CV.
	5	147' 0"	1,030' 6"	45' 2"	...	8.0'	CV.
	6	180' 0"	1,151' 11 $\frac{5}{8}$ "	53' 2"	...	8.0'	CVN.
Roosevelt Roads, Vieques, PR NS	1	155' 0"	1,088' 1"	48' 0"	...	1.0'	Inactive.
San Diego, CA NS	1	104' 0"	693' 6"	36' 6"	...	4.9'	CG. (Leased)
San Juan, PR	-	99' 9"	654' 5"	29' 0"	...	1.1'	CG, AO. (Leased)

TABLE 1 (Continued)
Drydocks Characteristics Summary
Marine Railways and Lifts

LOCATION	Capacity (long tons)	Length on blocks	Clear width	Depth over blocks or lift platform at MHW			MEAN TIDE RANGE	SUITABLE FOR DOCKING
				Fore	Aft.			
Annapolis, MD NS Railway	120	72' 0"	36' 0"	9' 2"	9' 11"		0.9'	Station craft and barges.
Patuxent River, MD NAS SESTF Lift	250	Cradle	55' 0"	16' 7"	16' 7"		1.2'	SES. Station craft.
SAR Lift	60	Cradle	22' 0"	8' 1"	8' 1"		1.2'	
Pearl Harbor, HI NSY Railway No. 2	2,500	368' 0"	51' 0"	19' 0"	22' 6"		1.5'	SS, DD and Fleet tugs.
Philadelphia, PA NSY Railway No. 1	2,500	324' 0"	51' 0"	22' 0"	25' 6"		5.6'	SS, DD, FF and Fleet tugs. SS, DD, FF and Fleet tugs.
Railway No. 2	2,500	324' 0"	51' 0"	22' 0"	25' 6"		5.6'	

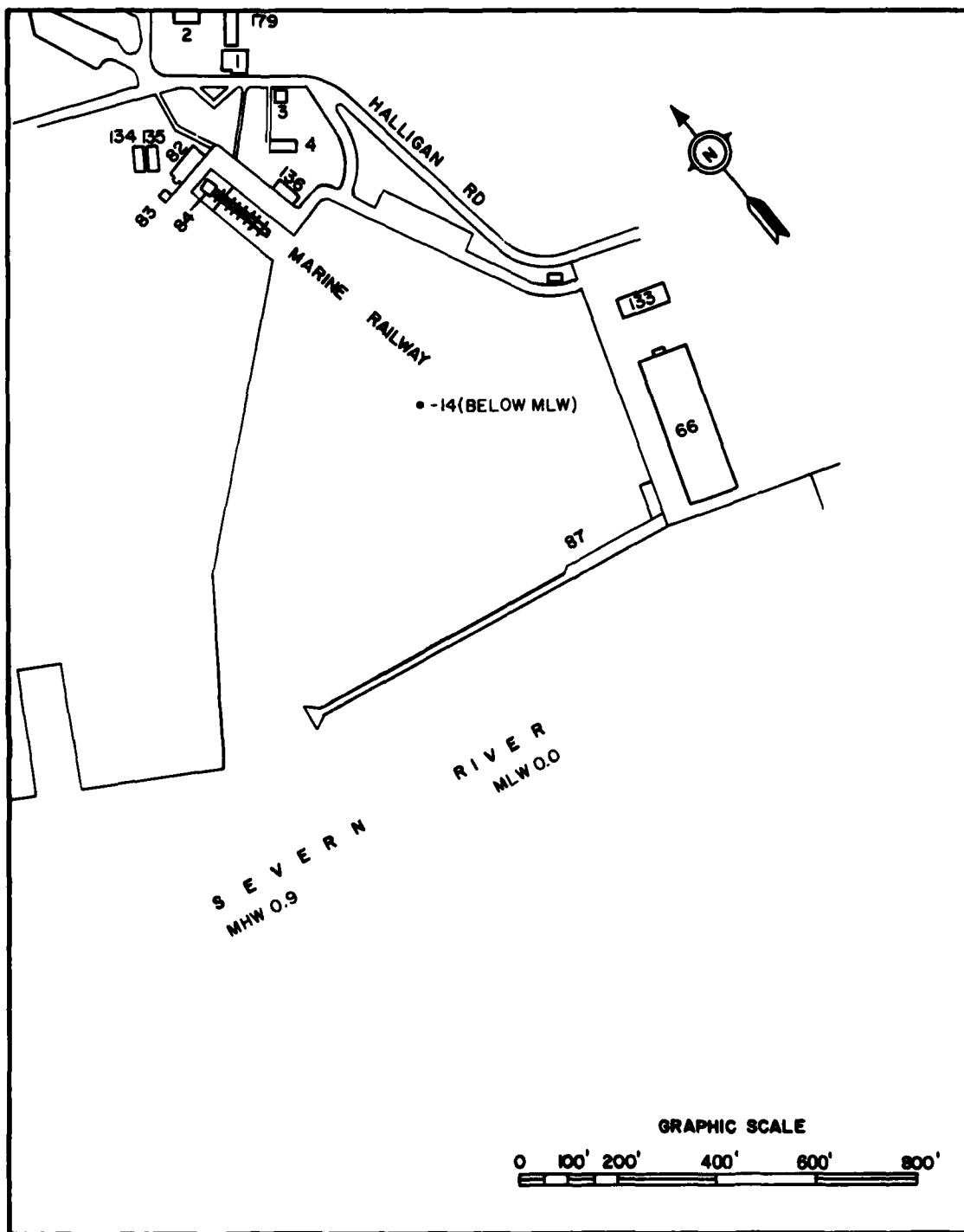


FIGURE 1
Location of Marine Railway, Annapolis Naval Station, Annapolis, Maryland

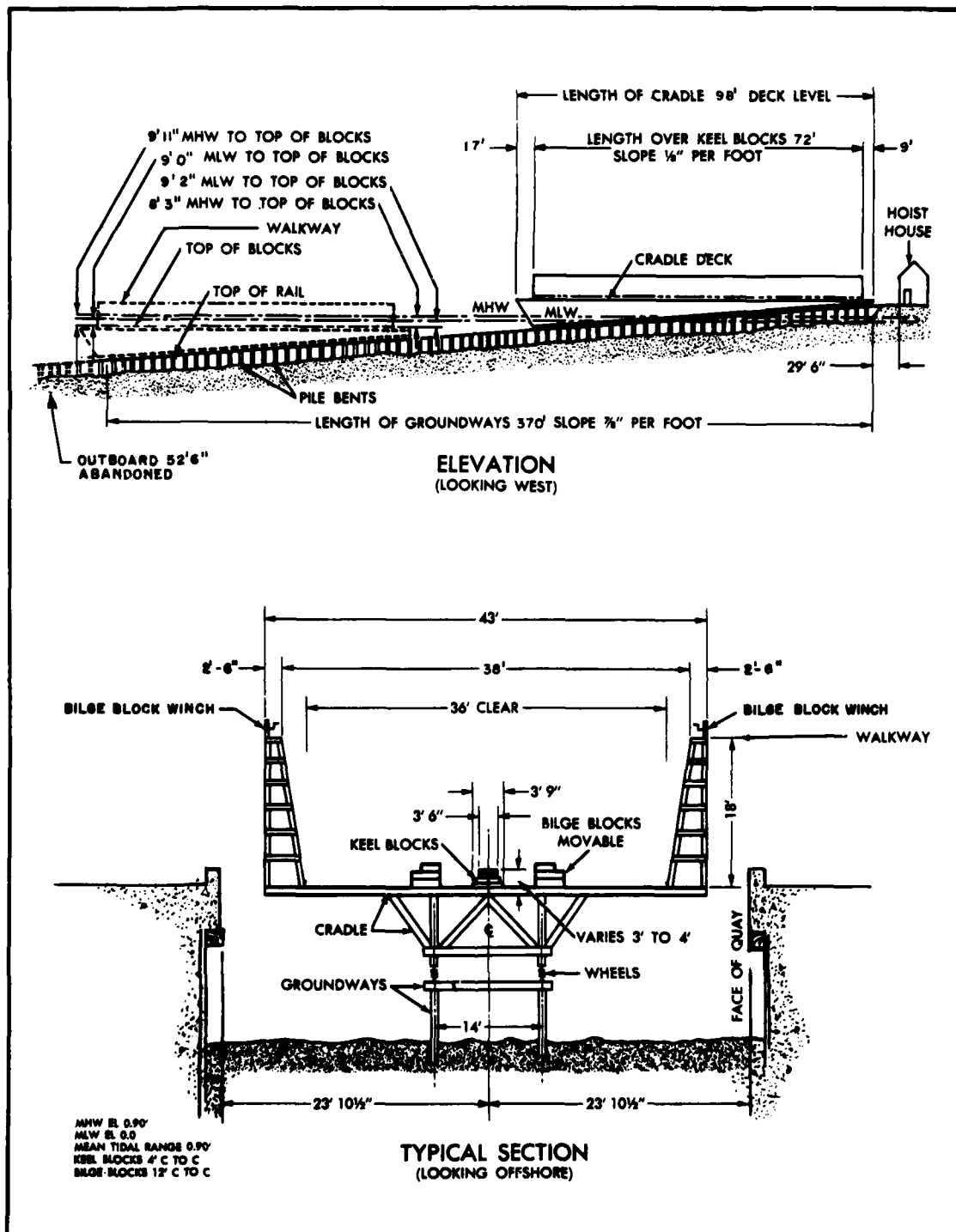


FIGURE 2
 Annapolis Naval Station Marine Railway

Capacity	120 lg tons.
For docking	Station craft and barges.
Wharf	On two sides.
Groundway	Foundation- Piles.
	Construction materials- Offshore, wood piles and wood bents. Inshore, concrete and wood.
	Width of track- 14'0"
	Number of rails- Two.
	Slope of track- 7/8" per ft.
Cradle	Slope of deck- Level.
	Slope at top of keel blocks- 1/8" per ft.
	Material- Cradle framing, wood. Superstructure framing, wood.
	Speed- uphaul, 10 fpm; downhaul 10 fpm.
	Wheels- 54, 12" diameter.
Hauling mechanism ...	Motor- 1 electric, 50 hp, 440 v, 3 ph, 60 hz, 40 kw.
	Cables- Uphaul, 2 cables, 1-1/2" diameter.
	Downhaul, one cable, 1" diameter.
Fire protection	Station hydrant adjacent to railway.
Steam	2" main, one outlet east side.
Compressed air	1" main, 75 cfm at 150 psi, three outlets east side, 4 outlets west side.
Cranes	Mobile yard.

FIGURE 2 (Continued)
Annapolis Naval Station Marine Railway

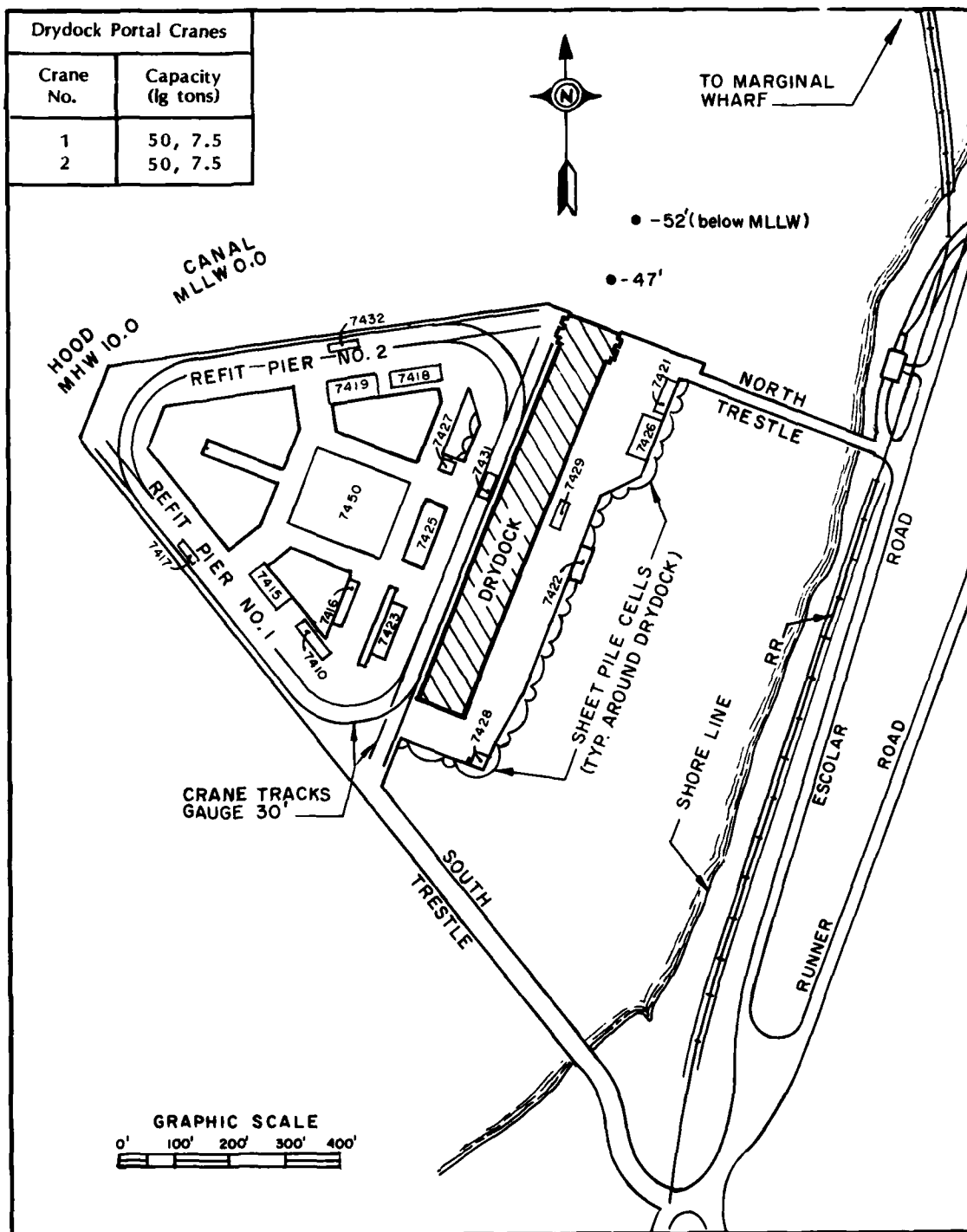


FIGURE 3
Location of Drydock, TRIDENT Refit Facility, Bangor, Washington

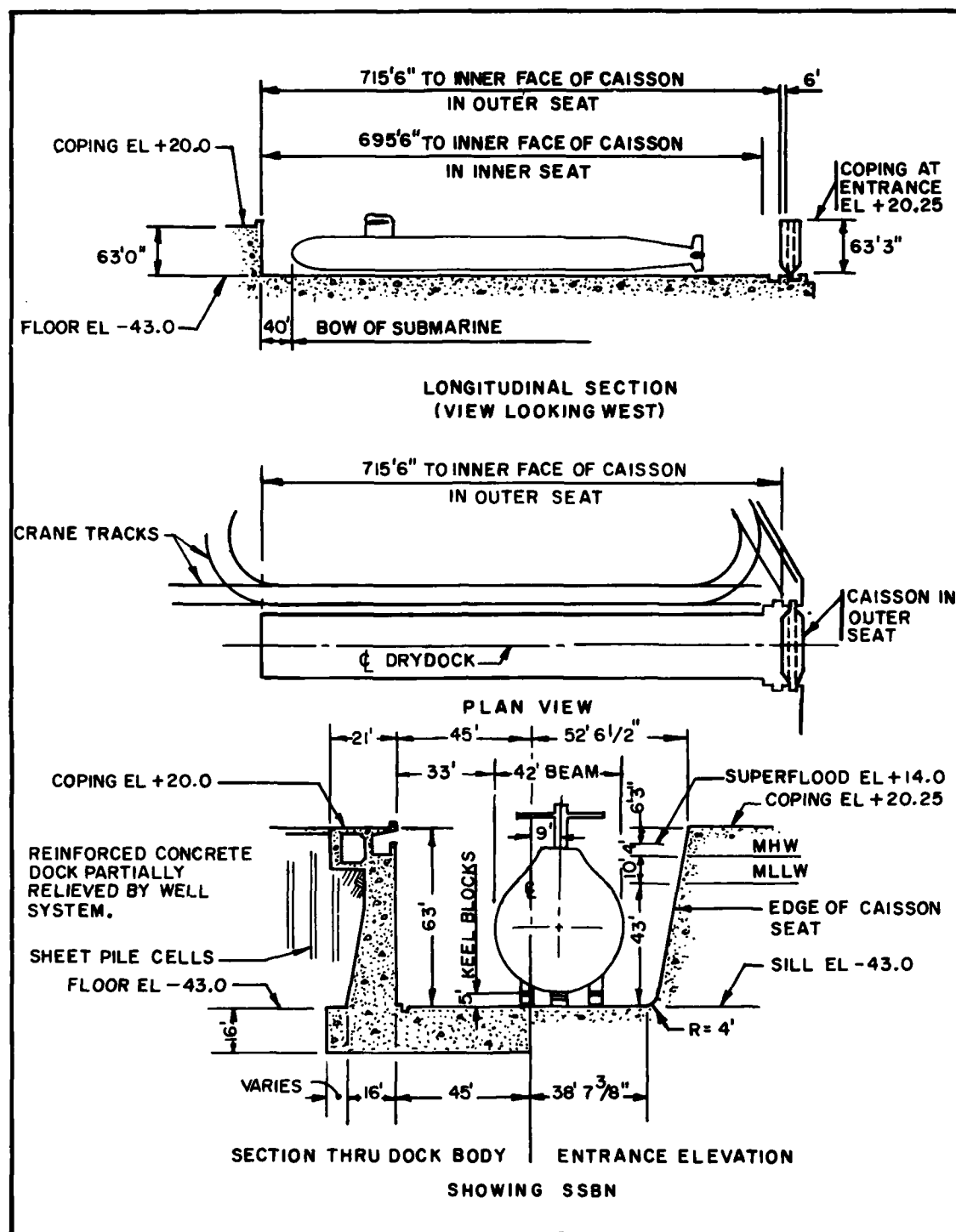


FIGURE 4
TRIDENT Refit Facility, Bangor Drydock

Date Completed	Suitable for Docking	Foundation	Construction Material
1981	SSBN	Earth	Concrete
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Three 42", 700 hp, 162,000 gpm. One dewatering pump used for superflooding.		
	Time to dewater: 165 min.		
Drainage pumps	Two 12", 200 hp, 5,000 gpm.		
Flooding	Through culverts. Time to flood: 60 min.		
Capstans	9 total: 1 at head, 1 each side of entrance, 3 each side, 30 fpm at 30k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	94'9"	
Auxiliary ..	7.5 lg tons	135'0"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	2,000	1 east side and 5 west side at 400 amps; 2 east side and 14 west side at 200 amps; 4 east side at 100 amps.
Ac, 3 Ph, 60 Hz ..	450	3,200	8 each side at 400 amps.
Ac, 3 Ph, 60 Hz ..	120/208	1,000	4 west side at 100 amps; 8 west side and 2 east side at 60 amps.
Fresh water	12" mains, 610 gpm at 50 psi, six 1-1/2" outlets each side.		
Fire/flushing	12" mains, 3,000 gpm at 125 psi, five 2-1/2" and one 2" outlets each side.		
Aux sea water	8" supply and return mains, 1,650 gpm at 80 psi, ten 2-1/2" supply and ten 2-1/2" return connections west side.		
Chilled water	6" supply and return mains, 600 gpm at 65 psi, one 6" supply and one 6" return connections west side.		
Low pressure air ..	8" mains, 3,000 cfm at 100 psi, forty 1-1/4" each side.		
High quality/	3" main, 800 cfm at 145 psi, eleven 1-1/4" and ten 3/4" outlets west side.		
Sanitary sewer	4" force mains, 100 gpm at 50 psi, two 2-1/2" inlets each side.		
Ship overboard	4" force main, 4,600 gpd at 150 psi, two 2-1/2" inlets each side.		
drain			

FIGURE 4 (Continued)
TRIDENT Refit Facility, Bangor Drydock

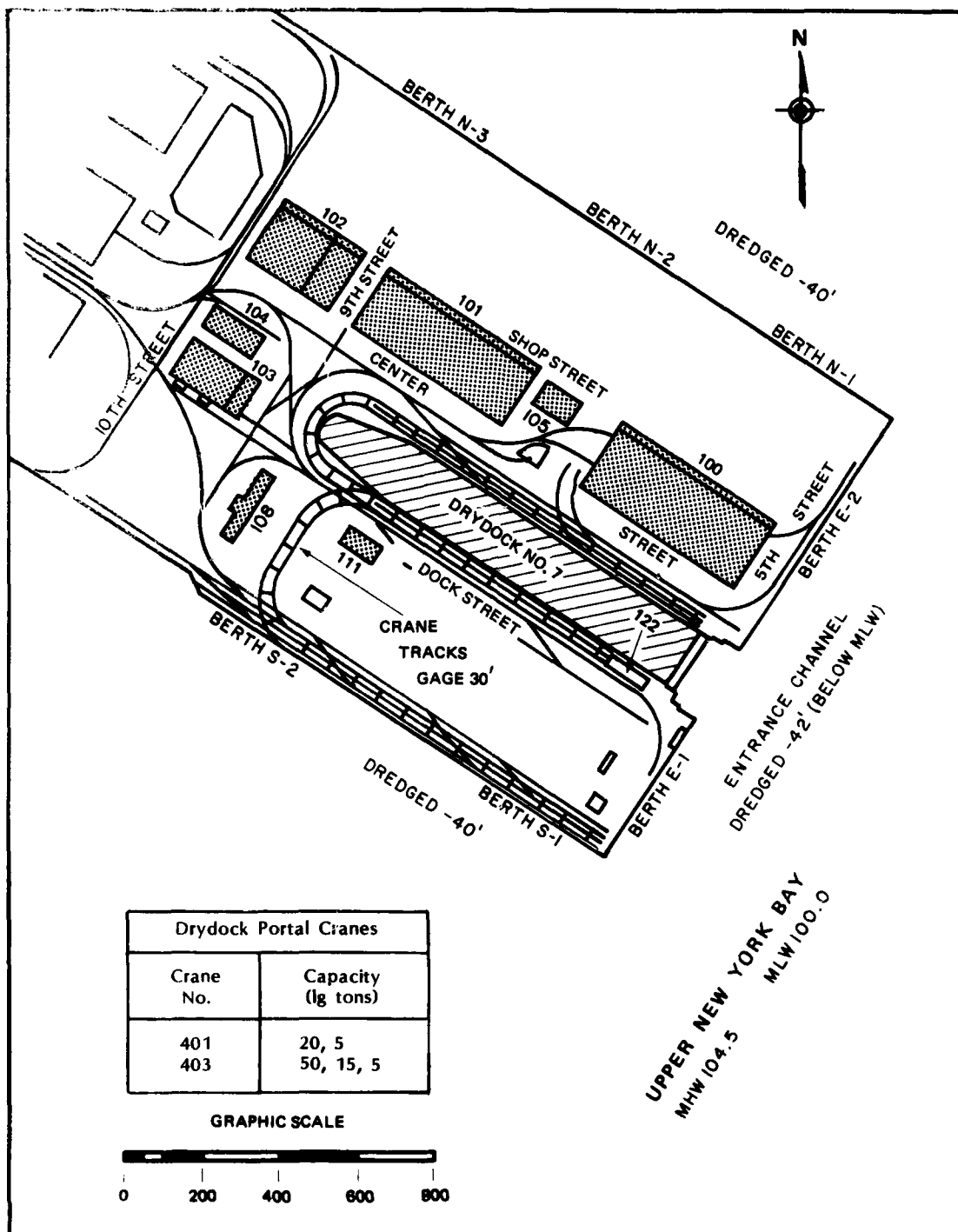


FIGURE 5
 Location of Drydock, Military Ocean Terminal, Bayonne, New Jersey

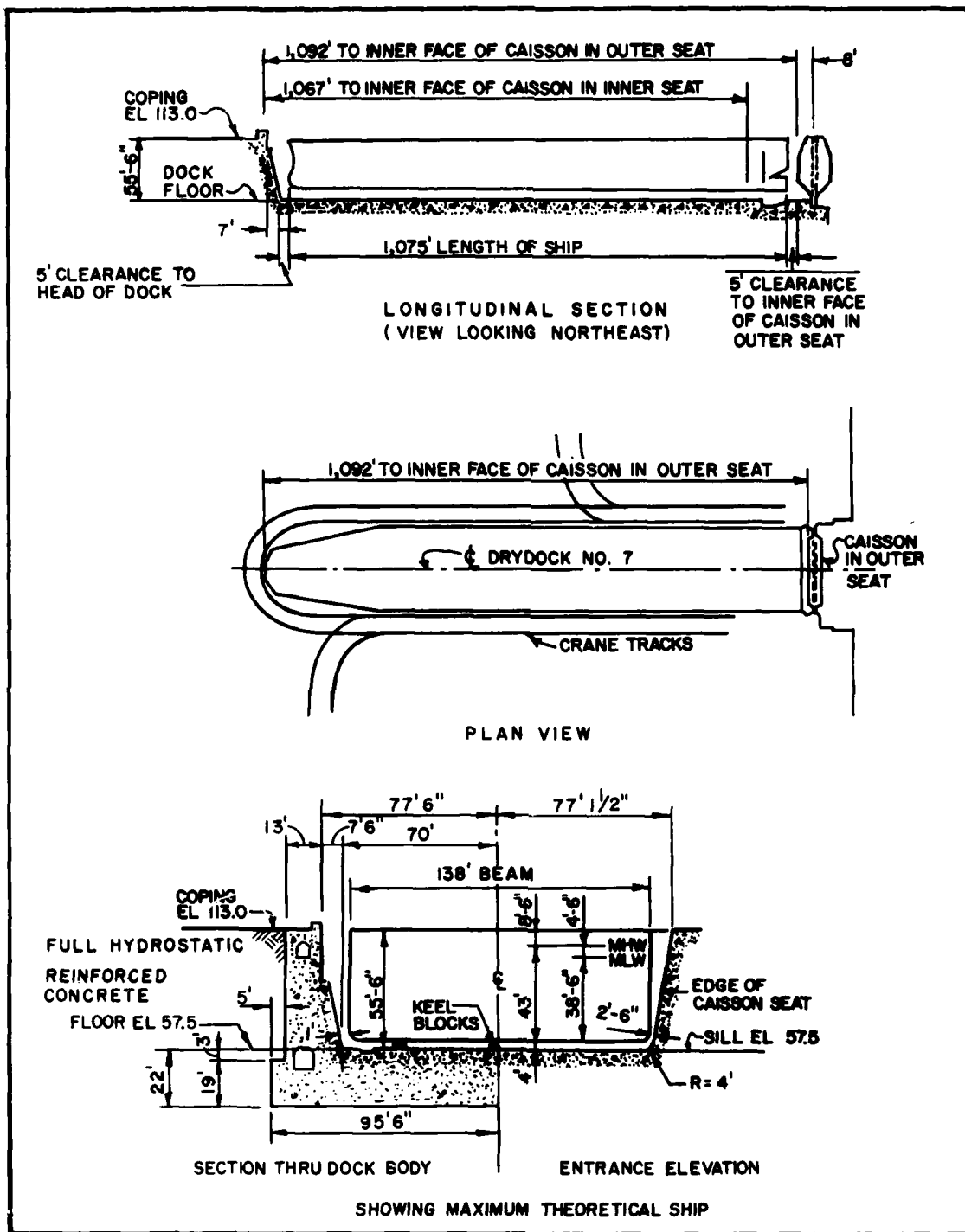


FIGURE 6
Military Ocean Terminal Drydock No. 7

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	CV	Earth	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Four 54", 1,200 hp, 520,000 gpm. Time to dewater: 200 min.		
Drainage pumps	Two 16", 250 hp, 19,000 gpm.		
Flooding	Through culverts. Time to flood: 150 min.		
Capstans	16 total: 1 at head, 1 each side of entrance, 30 fpm at 24k; 6 each side, 1 at Berth E-1, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	93'4"	
Auxiliary ..	15 lg tons	137'6"	
Whip	5 lg tons	139'6", 80' min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	4,160	400	2 south side at 200 amps.
Ac, 3 Ph, 60 Hz ..	460	1,600	8 north side at 400 amps.
Ac, 3 Ph, 60 Hz ..	460	1,600	6 south side at 400 amps.
Item	Data		
Fresh water	6" mains, 3,000 gpm at 50 psi, nine 2-1/2" and three 1-1/2" outlets north side, eight 2-1/2" and four 1-1/2" outlets south side.		
Salt water	8" mains, 5,000 gpm at 110 psi, eleven 2-1/2" and four 1-1/2" outlets north side, four 6", eleven 2-1/2" and three 1-1/2" outlets south side.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 1,800 cfm at 100 psi, twelve 2" and eighteen 1-1/2" outlets each side.		
Steam	6" mains, 15,000 phr at 125 psi, five 2" outlets north side, six 2" outlets south side, three 1-1/2" outlets each side.		
Sanitary sewer	8" mains, 1,000 gpm, twenty-seven 6" inlets each side.		

FIGURE 6 (Continued)
Military Ocean Terminal Drydock No. 7

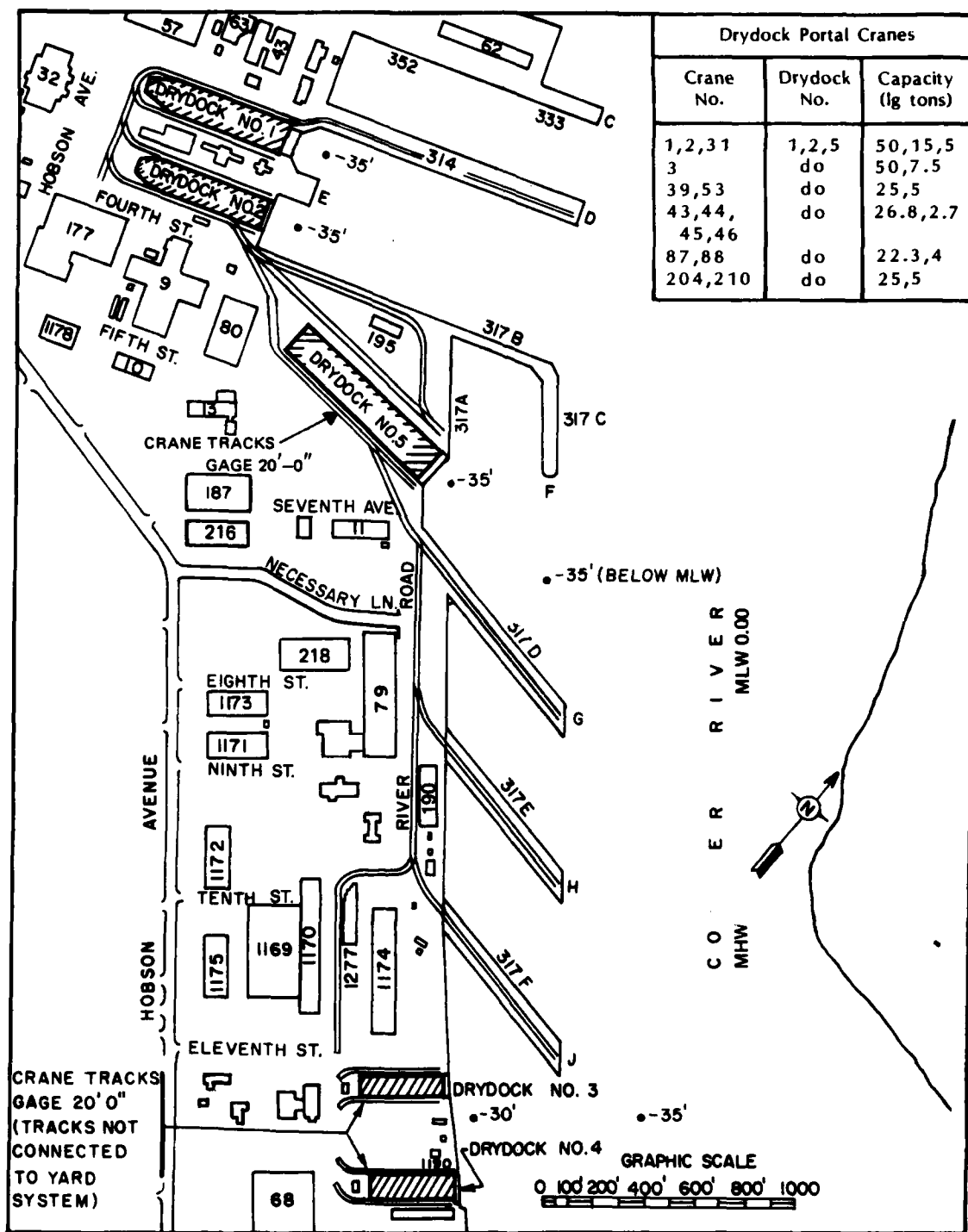


FIGURE 7
Location of Drydocks, Charleston Naval Shipyard, Charleston, South Carolina

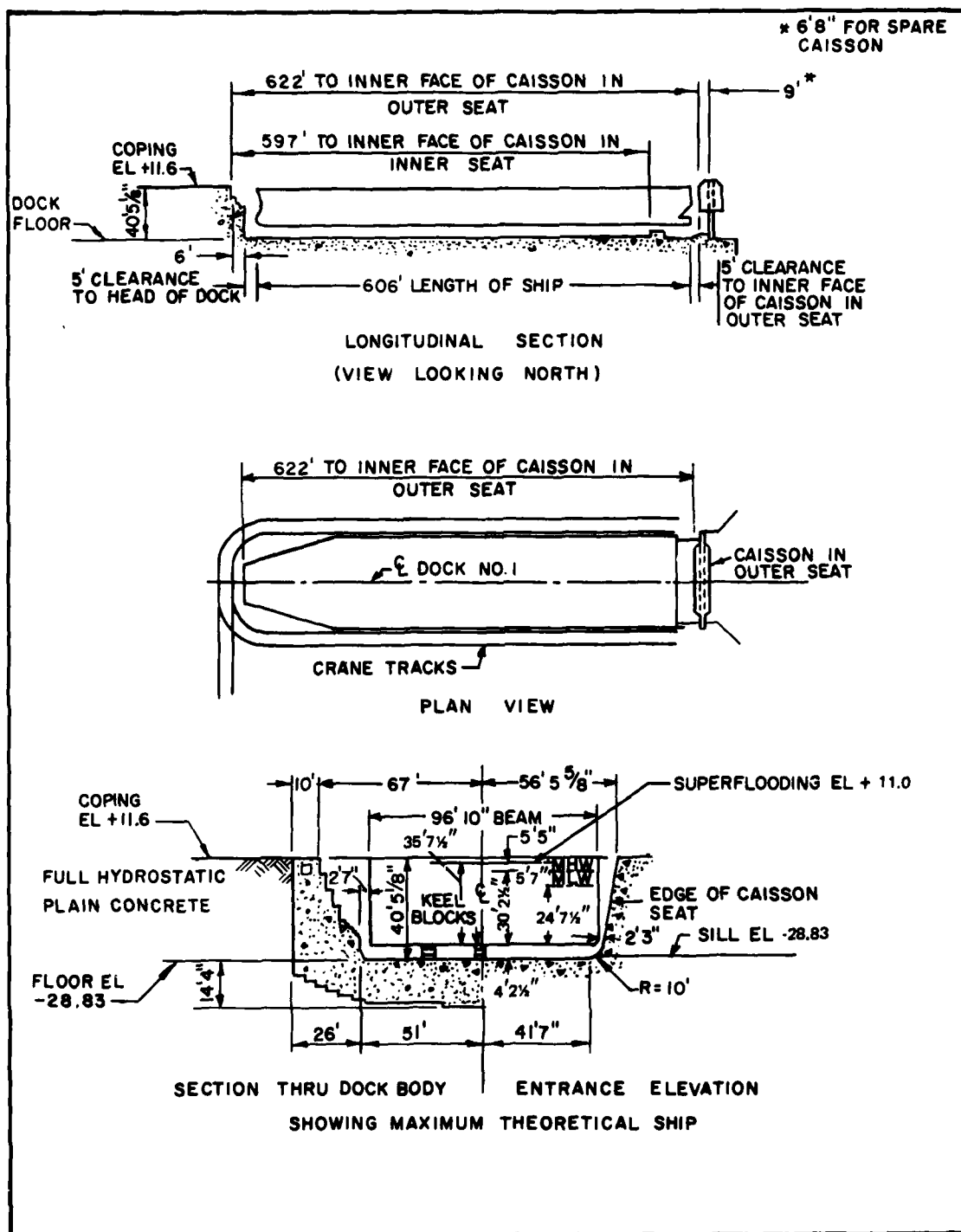


FIGURE 8
Charleston Naval Shipyard Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1903	CGN, AS, SSBN	Earth	Concrete and granite
Closure	Caisson, steel (fin keel type). Spare caisson, steel (rectangular box type), also used for Drydock No. 2.		
Dewatering pumps ..	Four 36", 300 hp, 140,000 gpm. Also connected to Drydock No. 2 pumphouse.		
	Time to dewater: 120 min.		
Drainage pumps	Two 12", 70 hp, 10,000 gpm.		
Flooding	Through caisson. Time to flood: 90 min. Superflood- ing pumps: two 30", 125 hp, 50,000 gpm.		
Capstans	7 total: 1 at head, 63 fpm at 6.7k; 1 each side of entrance, 1 each side, 17 fpm at 12k; 1 each side, 28 fpm at 7.3k. Winches: 2 total at head, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	120'0"	
Auxiliary ..	7.5 lg tons	158'0"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	13,200	400	1 north side at 400 amps.
Ac, 3 Ph, 60 Hz ..	460	1,500	5 no., 3 so. at 250 amps.
Ac, 3 Ph, 60 Hz ..	460	2,400	1 north side and 2 south side at 1,200 amps.
Ac, 3 Ph, 60 Hz ..	460	400	1 south side at 400 amps.
Fresh water	3" mains, 230 gpm at 50 psi, three 3", four 2-1/2", thirteen 1-1/2" and two 3/4" outlets north side, four 2-1/2" and twelve 1-1/2" outlets south side.		
Salt water	8" mains, 2,400 gpm at 125 psi, one 4" and fifteen 2-1/2" outlets north side, one 4", eighteen 2-1/2" and one 1-1/2" outlets south side.		
Fire protection ...	Same as salt water and fresh water.		
Compressed air	3" mains, 1,600 cfm at 95 psi, eight 1-1/4" and four 1" outlets north side, one 1-1/2", eight 1-1/4", seven 1" and one 3/4" outlets south side. 6" headers at dock floor with outlets.		
Steam	6" and 8" main, 3,200 phr at 165 psi, twelve 1-1/2" outlets north side.		
Sanitary sewer	8" main, 300 gpm, fourteen 4" inlets each side.		

FIGURE 8 (Continued)
Charleston Naval Shipyard Drydock No. 1

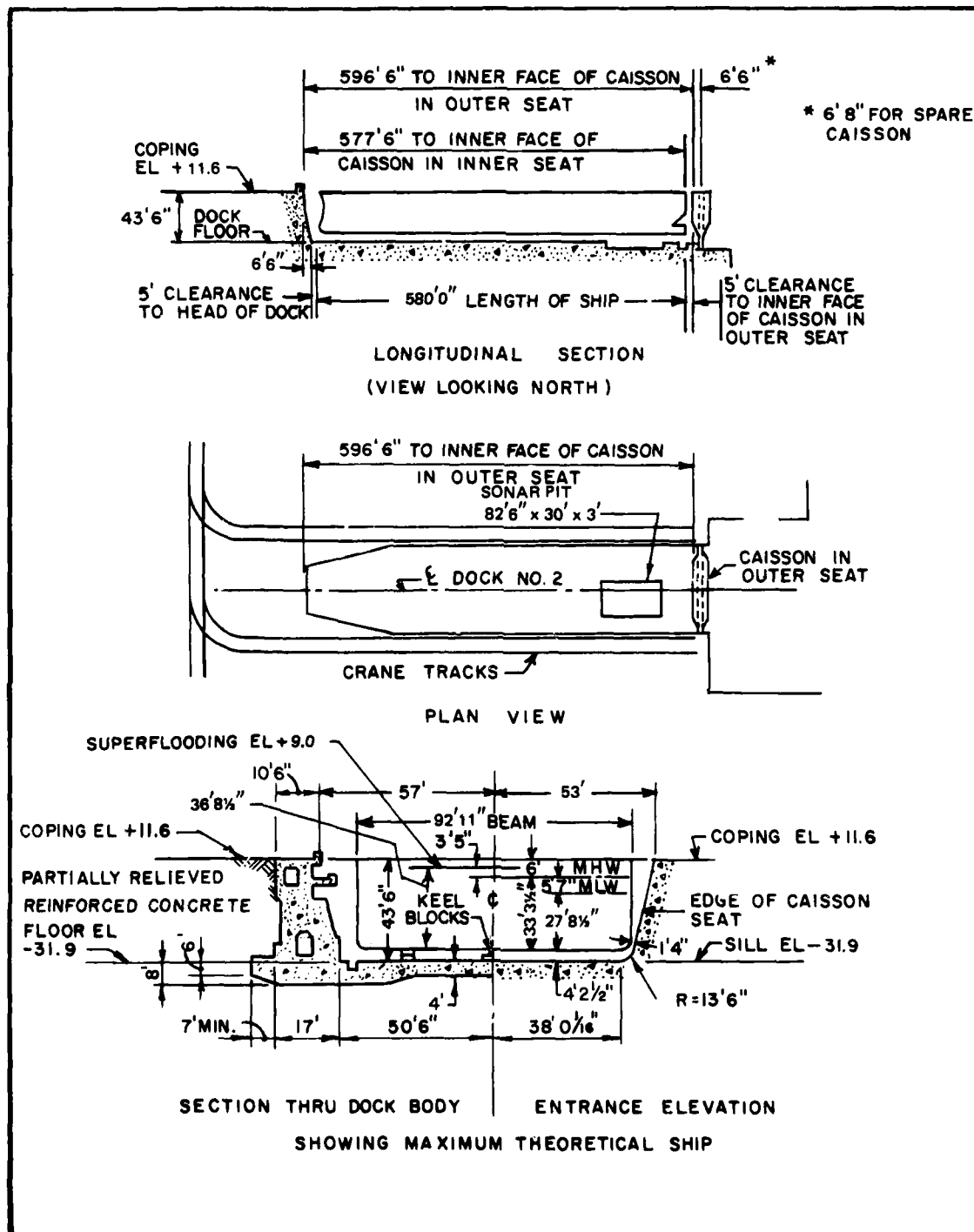


FIGURE 9
 Charleston Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1968	CGN, AS, SSBN	Earth	Concrete
Closure	Caisson, steel (rectangular box type). Spare caisson, steel (rectangular box type), also used for Drydock No. 1.		
Dewatering pumps ..	Two 48", 550 hp, 166,000 gpm. Also connected to Drydock No. 1 pumphouse. Time to dewater: 165 min.		
Drainage pumps	Two 16", 150 hp, 14,000 gpm. Also connected to Drydock No. 1 pumphouse.		
Flooding	Through caisson and culverts. Time to flood: 60 min. Superflooding by portable pumps.		
Capstans	8 total: 2 each side of entrance, 1 south side, 30 fpm at 24k; 3 north side, 2 south side, 30 fpm at 12k. Winches: 2 total at head, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	128'0"	
Auxiliary ..	7.5 lg tons	164'0"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	13,200	400	1 north side at 400 amps.
Ac, 3 Ph, 60 Hz ..	460	2,750	11 north side and 7 south side at 250 amps.
Ac, 3 Ph, 60 Hz ..	460	2,400	1 each side at 1,200 amps.
Fresh water	6" mains, 2,080 gpm at 50 psi, one 3", four 2-1/2", eight 1-1/2" and one 3/4" outlets north side, eight 2-1/2", fifteen 1-1/2" and two 3/4" outlets south side.		
Salt water	6" mains, 2,000 gpm at 125 psi, twenty-six 2-1/2" outlets each side.		
Fire protection ...	Same as salt water and fresh water.		
Compressed air	6" mains, 2,000 cfm at 95 psi, one 4" and ten 1-1/4" outlets north side, one 3", six 1-1/2", twenty 1-1/4" and eleven 3/4" outlets south side.		
Steam	6" mains, 12,000 phr at 165 psi, eight 1-1/2" outlets north side, seven 1-1/2" and two 3/4" outlets south side.		
Sanitary sewer	8" south side main, 200 gpm, twenty 4" inlets each side.		

FIGURE 9 (Continued)
Charleston Naval Shipyard Drydock No. 2

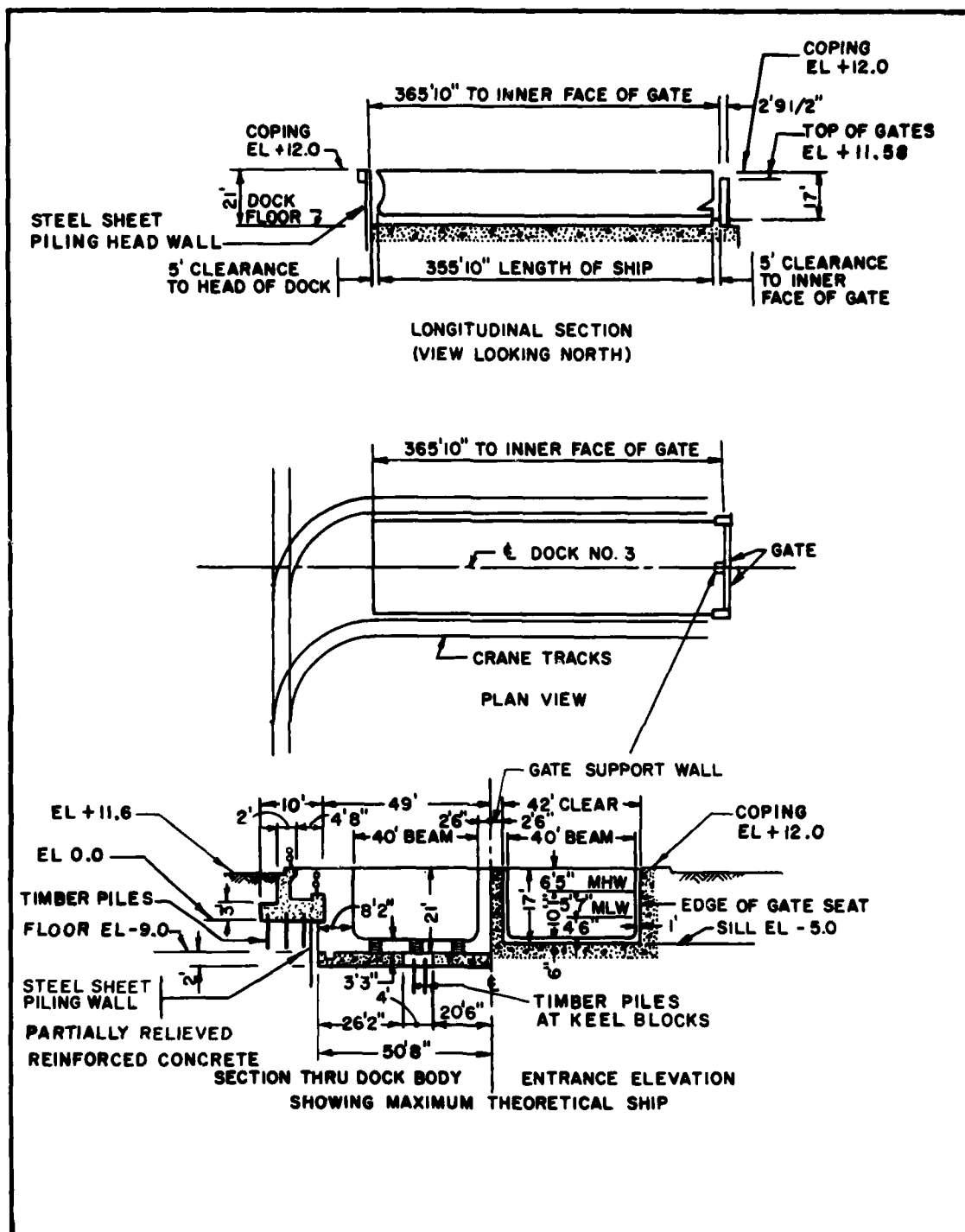


FIGURE 10
Charleston Naval Shipyard Drydock No. 3

Date Completed	Suitable for Docking	Foundation	Construction Material
1943	Service craft	Earth & piles	Concrete & sheet pile
Item	Data		
Closure	Two gates, steel and timber (vertical lift).		
Dewatering pumps ..	Two 18", 60 hp, 12,000 gpm. Pumps also used for Drydock No. 4.		
	Time to dewater: 8 hours.		
Drainage pumps	One 10", 15 hp, 1,500 gpm; one 8", 7-1/2 hp, 500 gpm.		
	Pumps also used for Drydock No. 4.		
Flooding	Through gates. Time to flood: 120 min.		
Portal Crane Maximum Capacities and Heights			
Portal cranes not currently used at this drydock.			
Ship and Industrial Services Furnished at Dock			
Item	Data		
Fresh water	6" mains (blanked at head of dock) at center and each side, 1,050 gpm at 50 psi.		
Fire protection ...	Two hydrants each side, 3,000 gpm at 120 psi.		
Compressed air	5" mains (blanked at head of dock) at center and each side, 1,500 cfm at 90 psi, one 1-1/2" outlet south side at head of dock.		

FIGURE 10 (Continued)
Charleston Naval Shipyard Drydock No. 3

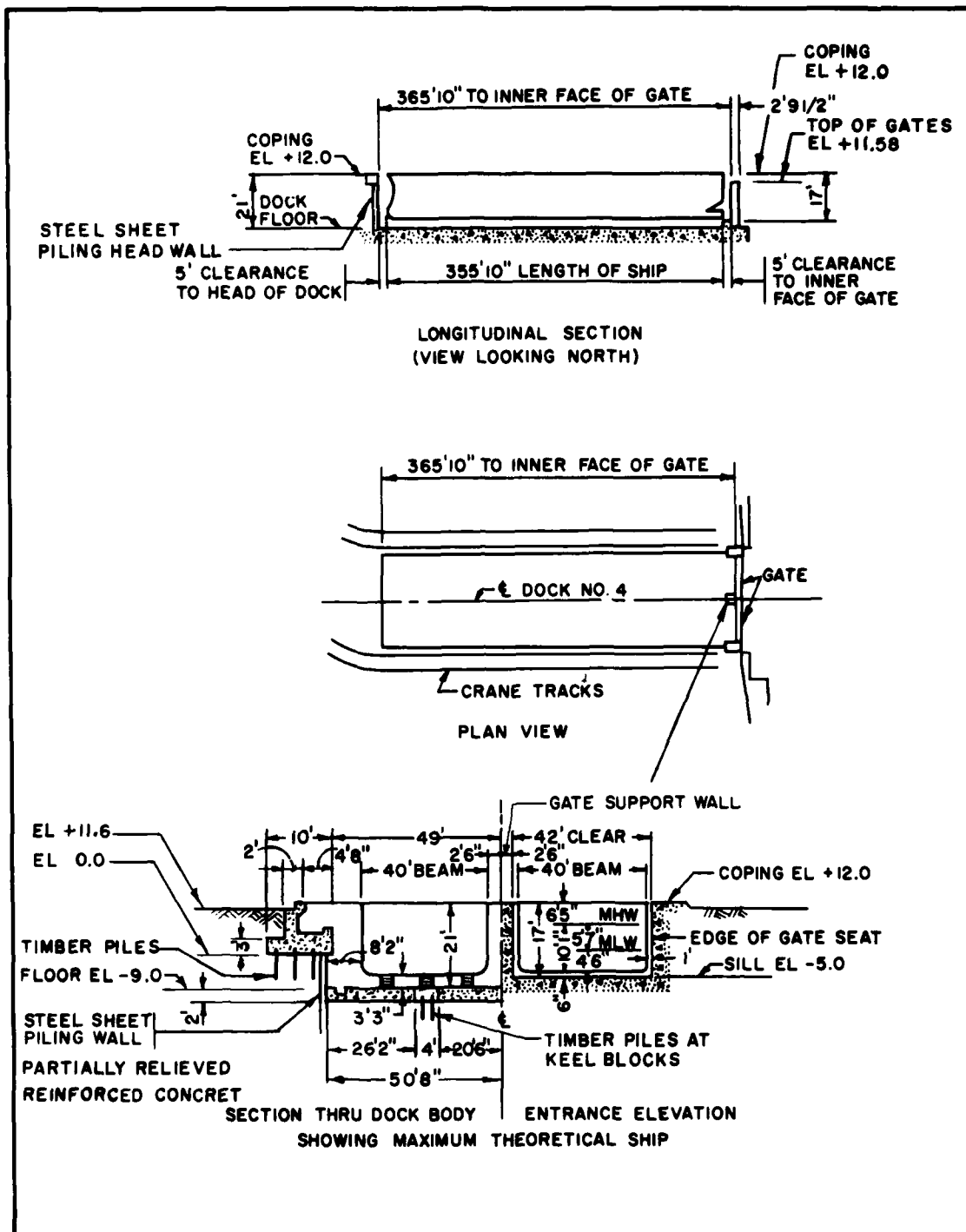


FIGURE 11
Charleston Naval Shipyard Drydock No. 4

Date Completed	Suitable for Docking	Foundation	Construction Material
1943	Service craft	Earth & piles	Concrete & sheet pile
Item	Data		
Closure	Two gates, steel and timber (vertical lift).		
Dewatering pumps ..	Two 18", 60 hp, 12,000 gpm. Pumps also used for Drydock No. 3.		
	Time to dewater: 8 hours.		
Drainage pumps	One 10", 15 hp, 1,500 gpm; one 8", 7-1/2 hp, 500 gpm.		
	Pumps also used for Drydock No. 3.		
Flooding	Through gates. Time to flood: 120 min.		
Portal Crane Maximum Capacities and Heights			
Portal cranes not currently used at this drydock.			
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	200	1 at head of dock at 200 amps.
Item	Data		
Fresh water	6" mains (blanked at head of dock) at center and each side, 1,050 gpm at 50 psi, one 2-1/2" outlet south side at head of dock.		
Fire protection ...	Two hydrants each side, 3,000 gpm at 120 psi.		
Compressed air	5" mains (blanked at head of dock) at center and each side, 1,500 cfm at 90 psi.		

FIGURE 11 (continued)
Charleston Naval Shipyard Drydock No. 4

Date Completed	Suitable for Docking	Foundation	Construction Material
1964	CGN, AS, SSBN	Earth	Concrete
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Three 42", 700 hp, 195,000 gpm. Time to dewater: 180 min.		
Drainage pumps	Two 14", 250 hp, 20,000 gpm.		
Flooding	Through culverts. Time to flood: 50 min. Super-flooding pumps: three 30", 125 hp, 63,000 gpm.		
Capstans	8 total: 1 each side of entrance, 30 fpm at 24k; 3 each side, 30 fpm at 12k. Winches: 3 total at head, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	113'0"	
Auxiliary ..	7.5 lg tons	153'0"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	12,000	11 north side and 19 south side at 400 amps.
Fresh water	8" mains, 2,000 gpm at 50 psi, four 2-1/2" and twelve 1-1/2" outlets each side.		
Salt water	14" mains, 5,400 gpm at 130 psi, sixteen 2-1/2" outlets each side.		
Fire protection ...	10" mains, 3,500 gpm at 125 psi, eight 4" and eight 2-1/2" outlets each side.		
Compressed air	8" mains, 5,000 cfm at 95 psi, four 2-1/2" and thirty-six 1-1/4" outlets each side. 6" headers at dock floor with outlets.		
Steam	6" mains, 60,000 phr at 165 psi, eight 1-1/2" and eight 1" outlets each side.		
Oxygen	3" mains, 85 cfm at 250 psi, seven 1" outlets each side.		
Sanitary sewer	8" south side main, 300 gpm, eight 4" inlets on centerline and each side.		
MAPP gas	4" mains, 100 cfm at 12 psi, seven 1" outlets each side.		

FIGURE 12 (Continued)
Charleston Naval Shipyard Drydock No. 5

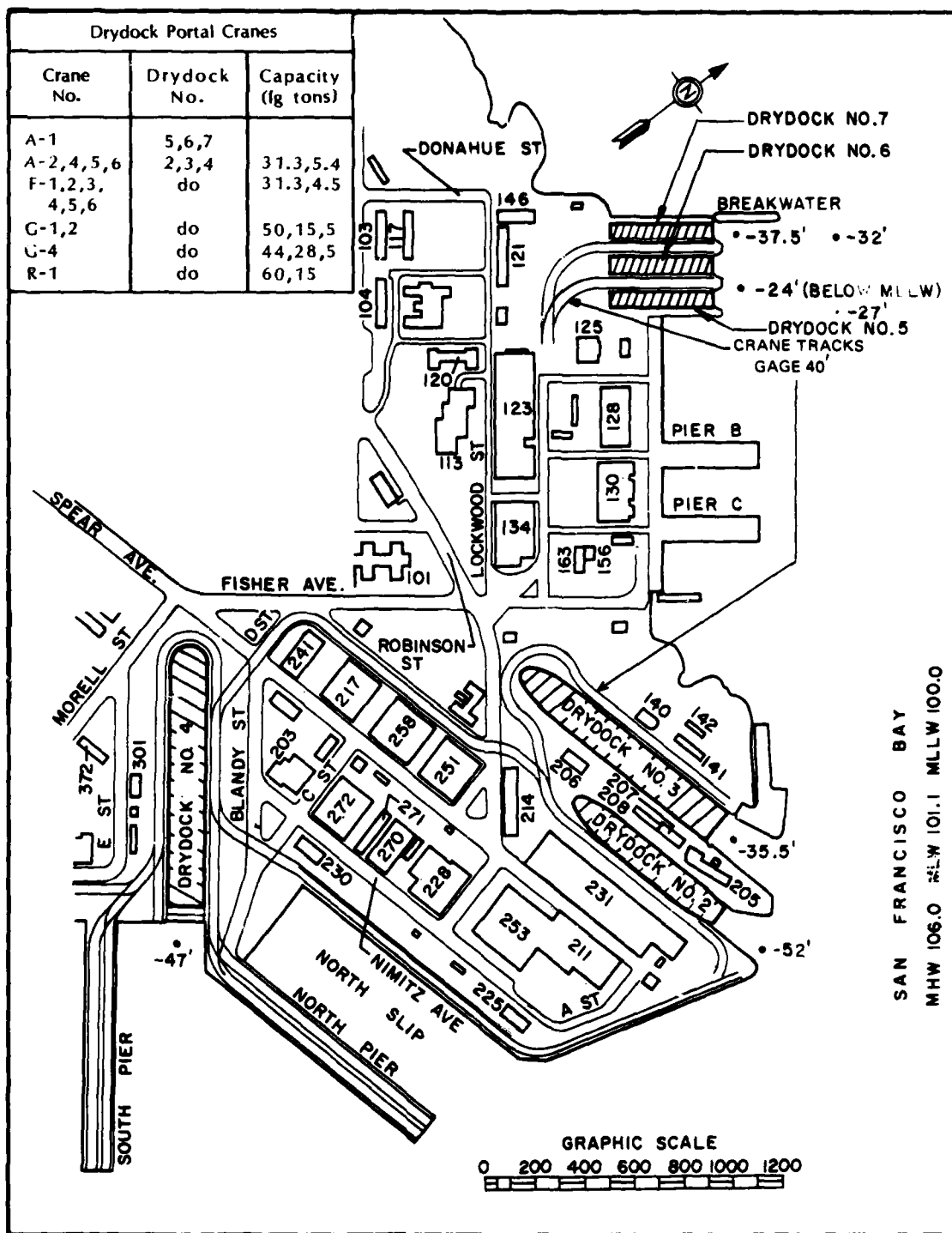


FIGURE 13
Location of Drydocks, Hunters Point Naval Shipyard, San Francisco, California

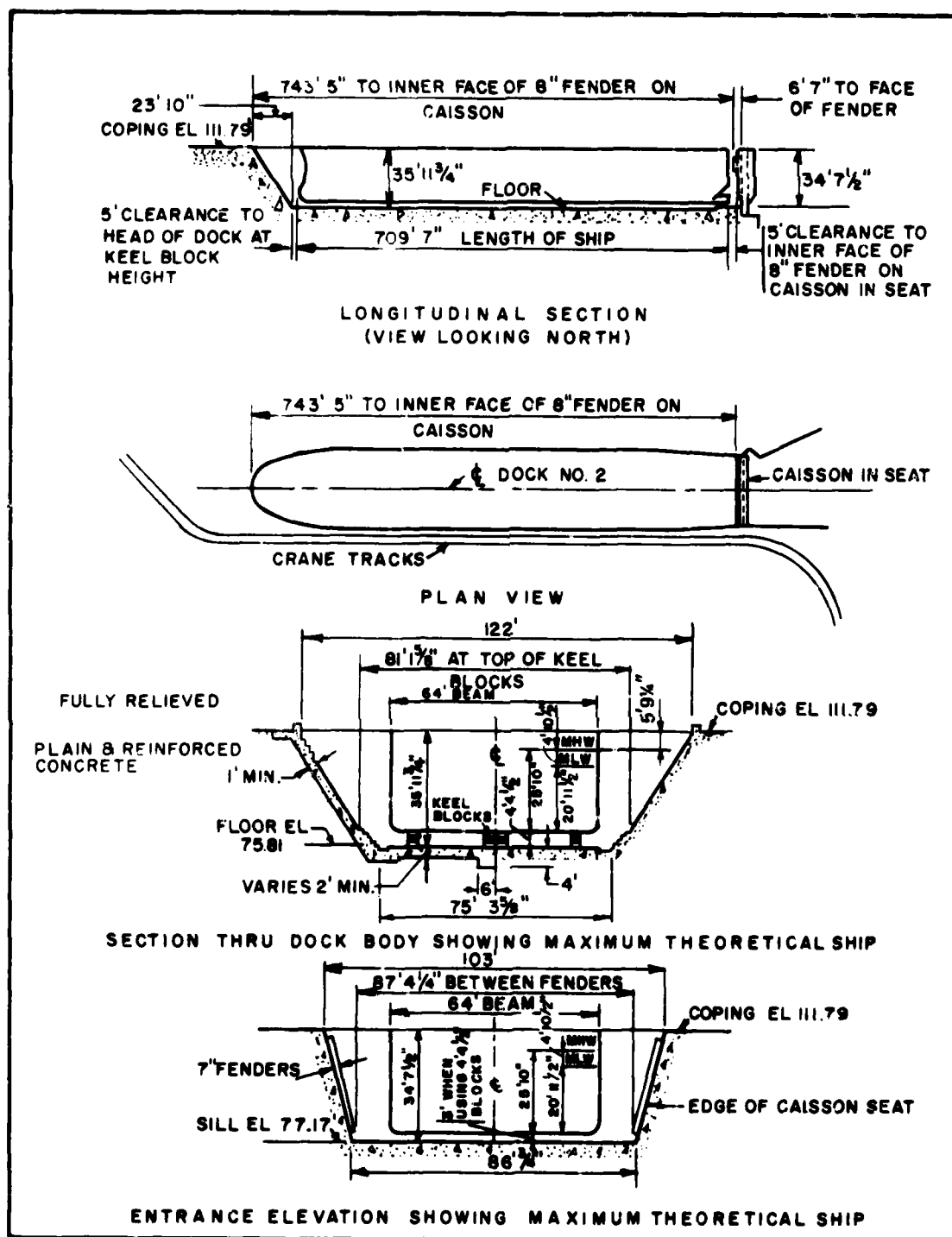


FIGURE 14
 Hunters Point Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1903	CG	Rock	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Three 38", 400 hp, 165,000 gpm. Time to dewater: 150 min.		
Drainage pumps	Two 8", 40 hp, 3,200 gpm.		
Flooding	Through caisson. Time to flood: 90 min.		
Capstans	8 total: 1 at head, 30 fpm at 36k; 1 each side of entrance, 1 south side, 12 fpm at 35k; 1 each side, 12 fpm at 30k; 2 north side, 30 fpm at 10k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	44 lg tons	121'0"	
Auxiliary ..	28 lg tons	185'0"	
Whip	5 lg tons	200'0", 90'0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	4,800	1 each side at 1,600 amps; 3 north side at 800 amps; 2 north side at 200 amps.
Item	Data		
Fresh water	6" mains, 250 gpm at 40 psi, six 2-1/2" and four 1-1/2" outlets each side.		
Salt water	8" mains, 2,000 gpm at 100 psi, six 4" and ten 2-1/2" outlets each side. 3" headers at dock floor with outlets.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 3,000 cfm at 100 psi, six 3" outlets each side. 3" headers at dock floor with outlets.		
Steam	6" mains, 30,000 phr at 100 psi, six 3" outlets each side.		
Oxygen	1-1/4" main, 100 psi, one 1-1/4" and five 1" outlets north side.		
Acetylene	1-1/4" main, 10 psi, one 1-1/4" and five 1" outlets north side.		
Sanitary sewer	10" mains, 500 gpm, eleven 6" inlets each side.		
Natural gas	3" main, 15 psi, four 2" outlets north side, three 2-1/2" and one 2" outlet south side.		

FIGURE 14 (Continued)
Hunters Point Naval Shipyard Drydock No. 2

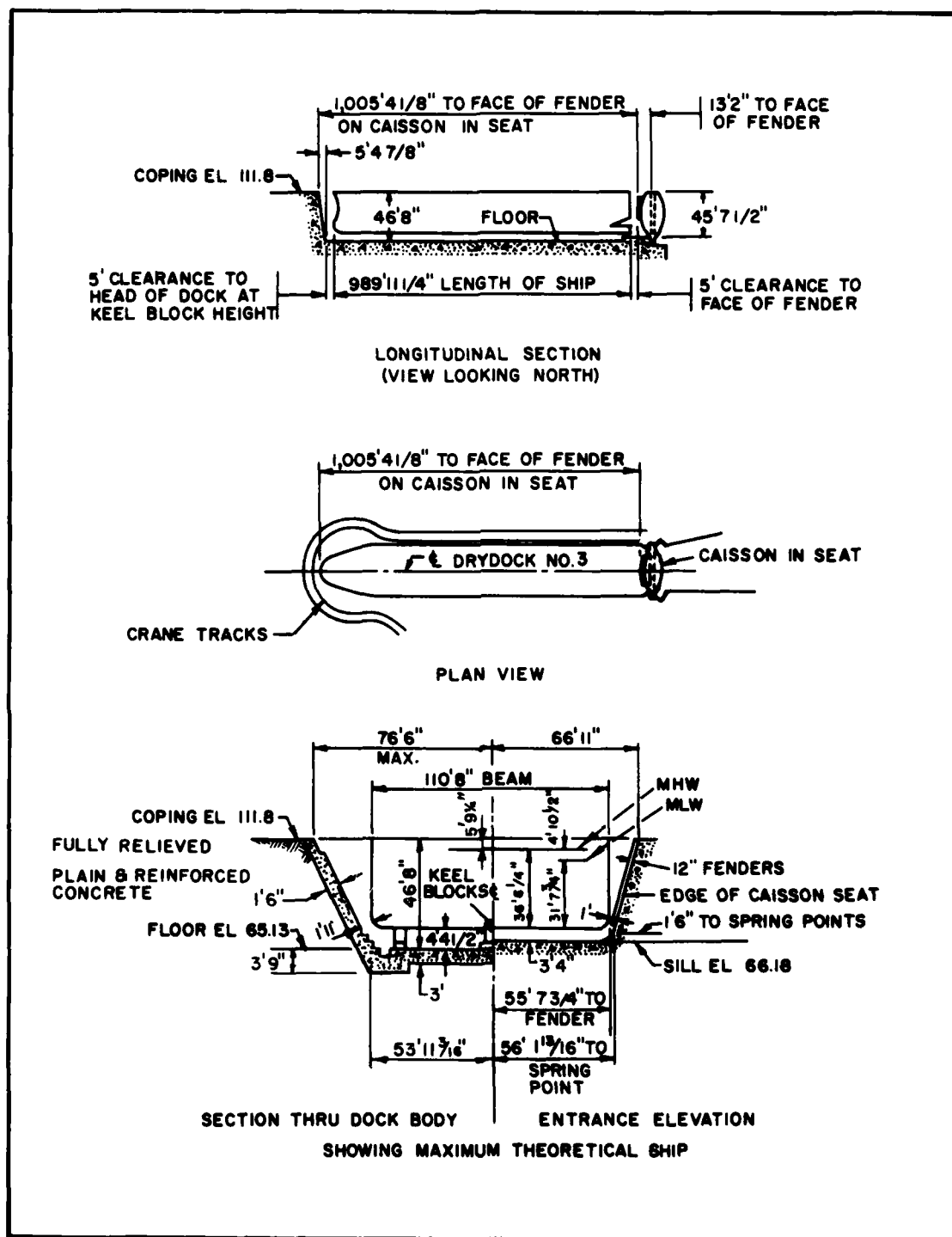


FIGURE 15
Hunters Point Naval Shipyard Drydock No. 3

Date Completed	Suitable for Docking	Foundation	Construction Material
1919	CV	Rock	Concrete
Item	Data		
Closure	Caisson, steel (ship type).		
Dewatering pumps ..	Four 48", 750 hp, 575,000 gpm. Time to dewater: 150 min.		
Drainage pumps	Two 16", 100 hp, 8,500 gpm.		
Flooding	Through caisson, Time to flood: 90 min.		
Capstans	9 total: 1 at head, 30 fpm at 30k; 1 each side of entrance, 3 each side, 30 fpm at 14k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	44 lg tons	102'0"	
Auxiliary ..	28 lg tons	176'0"	
Whip	5 lg tons	193'8", 90'0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	9,800	4 north side at 1,600 amps; 1 north side at 1,400 amps; 5 north side at 400 amps; 1 south side at 1,600 amps.
Item	Data		
Fresh water	4" and 6" mains, 300 gpm at 40 psi, twelve 2-1/2" and two 1-1/2" outlets north side, ten 2-1/2" and four 1-1/2" outlets south side.		
Salt water	8" mains, 2,500 gpm at 100 psi, fourteen 4" and four 2-1/2" outlets each side. 4" headers at dock floor with outlets.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 3,000 cfm at 100 psi, eight 3" outlets each side. 3" headers at dock floor with outlets.		
Steam	6" mains 20,000 phr at 100 psi, eight 3" outlets each side.		
Oxygen	1-1/2" main, 100 psi, four 1" outlets south side.		
Acetylene	1-1/2" main, 10 psi, four 1" outlets south side.		
Sanitary sewer	10" mains, 500 gpm, fifteen 6" inlets each side.		
Natural gas	3" mains, 15 psi, four 2-1/2" outlets each side.		

FIGURE 15 (Continued)
Hunters Point Naval Shipyard Drydock No. 3

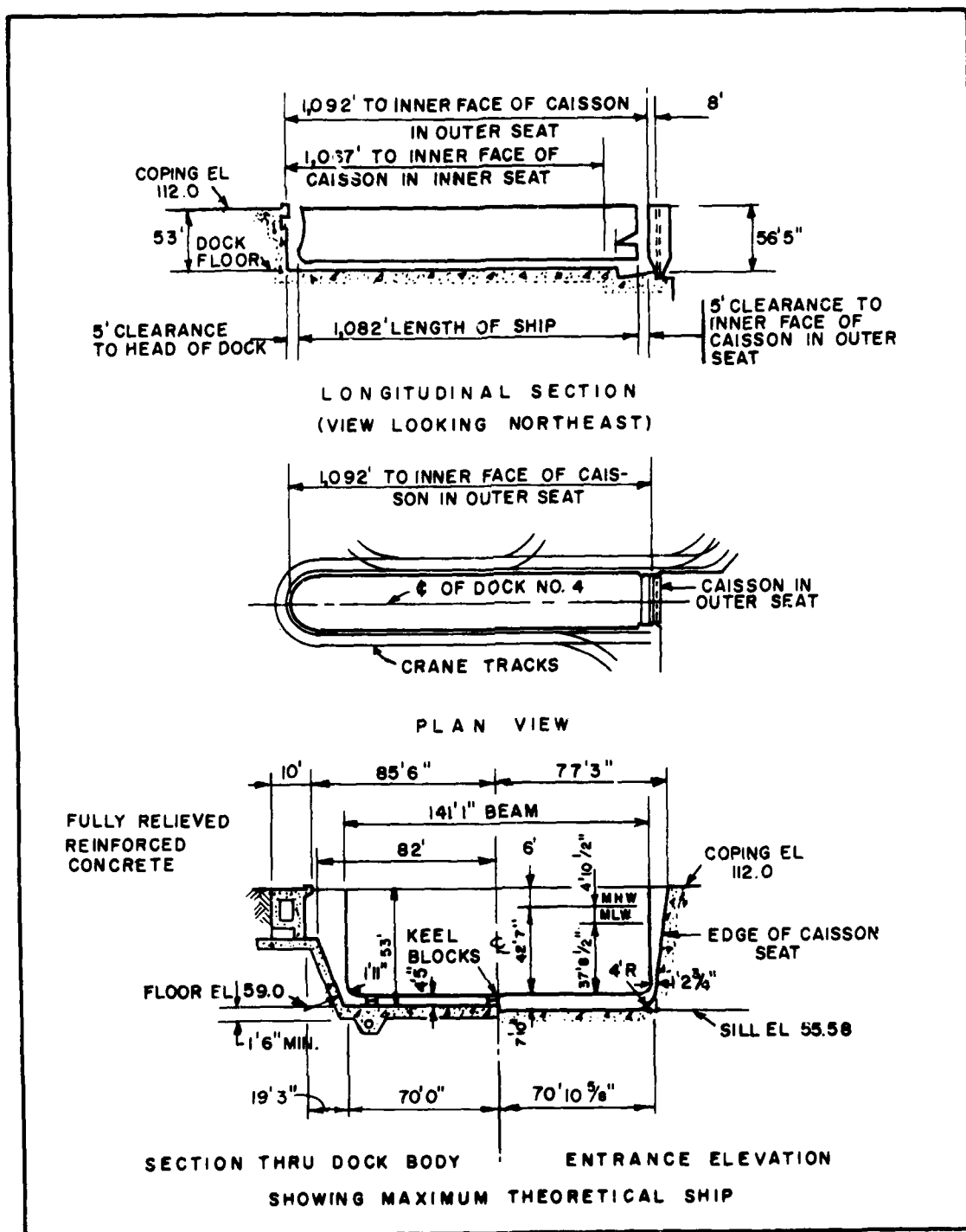


FIGURE 16
Hunters Point Naval Shipyard Drydock No. 4

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	CV	Rock	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Three 46", 1,500 hp, 390,000 gpm. Time to dewater: 150 min.		
Drainage pumps	Two 16", 150 hp, 10,000 gpm.		
Flooding	Through culverts. Time to flood: 60 min.		
Capstans	13 total: 1 at head, 2 each side of entrance, 30 fpm at 36k; 5 each side, 30 fpm at 16k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	44 lg tons	82'9"	
Auxiliary ..	28 lg tons	169'8"	
Whip	5 lg tons	188'8", 90'0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	12,800	2 each side at 3,200 amps; 4 each side at 1,600 amps.
Item	Data		
Fresh water	6" mains, 350 gpm at 40 psi, six 2-1/2" and six 1-1/2" outlets each side.		
Salt water	8" mains, 4,000 gpm at 100 psi, six 4" outlets each side. 4" headers at dock floor with outlets.		
Fire protection ...	10" and 12" mains, 7,000 gpm at 150 psi, twelve 4" outlets each side.		
Low pressure air ..	6" mains, 450 cfm at 100 psi, six 3" outlets each side. 3" headers at dock floor with outlets.		
High pressure air .	1" mains, 160 cfm at 3,000 psi, one 1" outlet each side.		
Steam	6" mains, 40,000 phr at 100 psi, six 3" outlets north side, five 3" outlets south side.		
Oxygen	2" mains, 1,000 cfm at 100 psi, one 2" outlet south side, twelve 1" outlets each side.		
Acetylene	2" mains, 1,000 cfm at 5 psi, one 2-1/2" outlet north side, one 2" outlet south side, twelve 1" outlets each side.		
Sanitary sewer	8" mains, 500 gpm, forty 6" inlets each side.		
Natural gas.....	4" main, 15 psi, one 1-1/4" outlet north side.		

FIGURE 16 (Continued)
Hunters Point Naval Shipyard Drydock No. 4

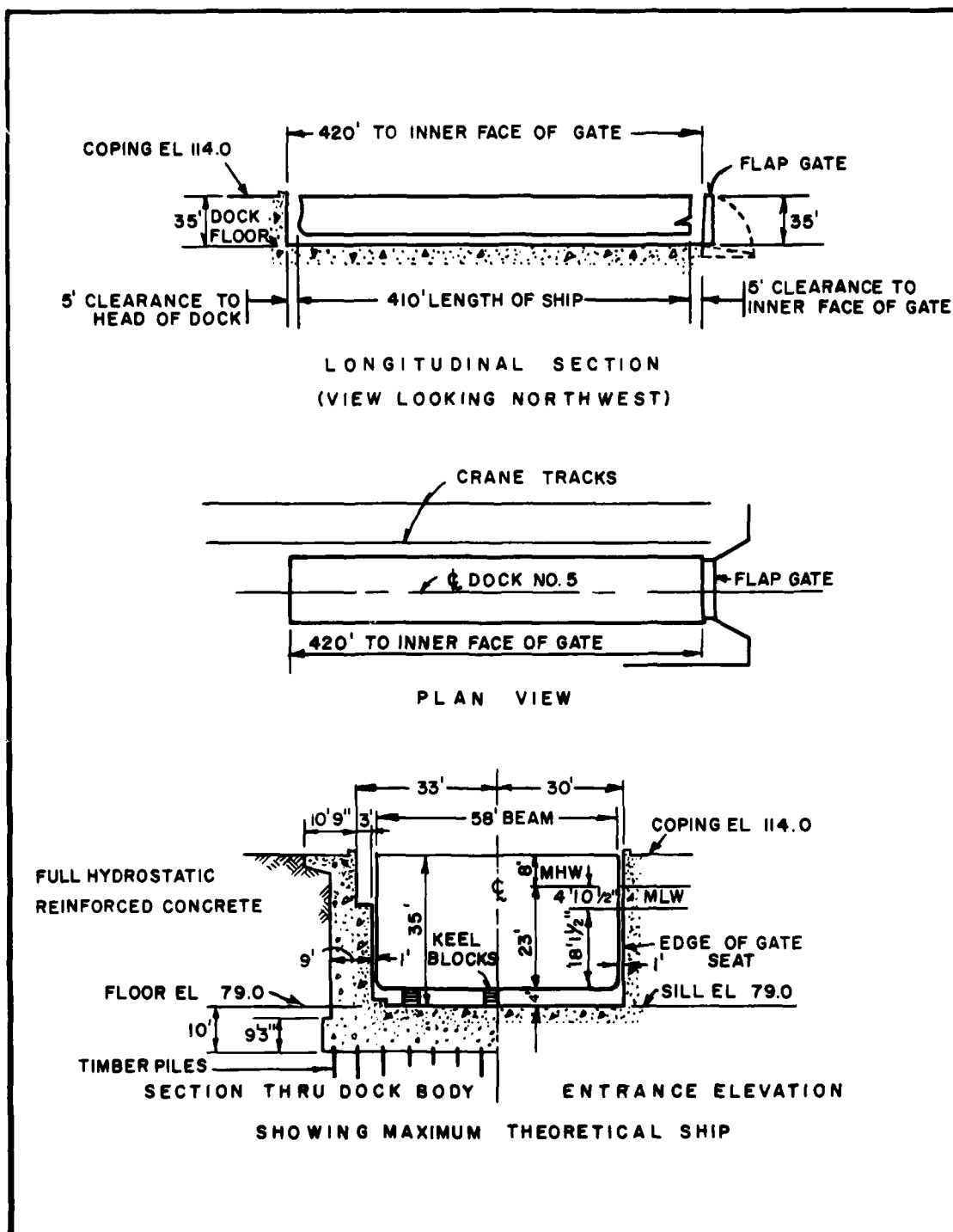


FIGURE 17
Hunters Point Naval Shipyard Drydock No. 5

Date Completed	Suitable for Docking	Foundation	Construction Material
1944	DD, SS	Piles	Concrete
Item	Data		
Closure	Flap gate, steel.		
Dewatering pumps ..	Four 24", 200 hp, 80,000 gpm. Time to dewater: 75 min.		
Drainage pumps	One 4", 7.5 hp, 450 gpm.		
Flooding	Through culverts. Time to flood: 45 min.		
Capstans	2 total: on south side, 30 fpm at 16k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	17 lg tons	105'7"	
Auxiliary ..	5.4 lg tons	126'2"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	1,600	1 north side at 1,600 amps.
Item	Data		
Fresh water	4" and 6" main, 200 gpm at 40 psi, two 2-1/2" and two 2" outlets north side.		
Salt water	6" main, 1,500 gpm at 100 psi, three 4" and five 2-1/2" outlets north side. 4" headers at dock floor with outlets.		
Fire protection ...	Same as salt water.		
Low pressure air ..	4" mains, 4,000 cfm at 100 psi, three 3" outlets north side. 3" headers at dock floor with outlets.		
High pressure air .	1" main, 150 cfm at 3,000 psi, one 1" outlet north side.		
Steam	4" and 6" main, 5,000 phr at 100 psi, three 3" outlets north side.		
Sanitary sewer	6" mains, 600 gpm, ten 6" inlets each side.		
Natural gas	3" main, 15 psi, one 2-1/2" outlet north side.		

FIGURE 17 (Continued)
 Hunters Point Naval Shipyard No. 5

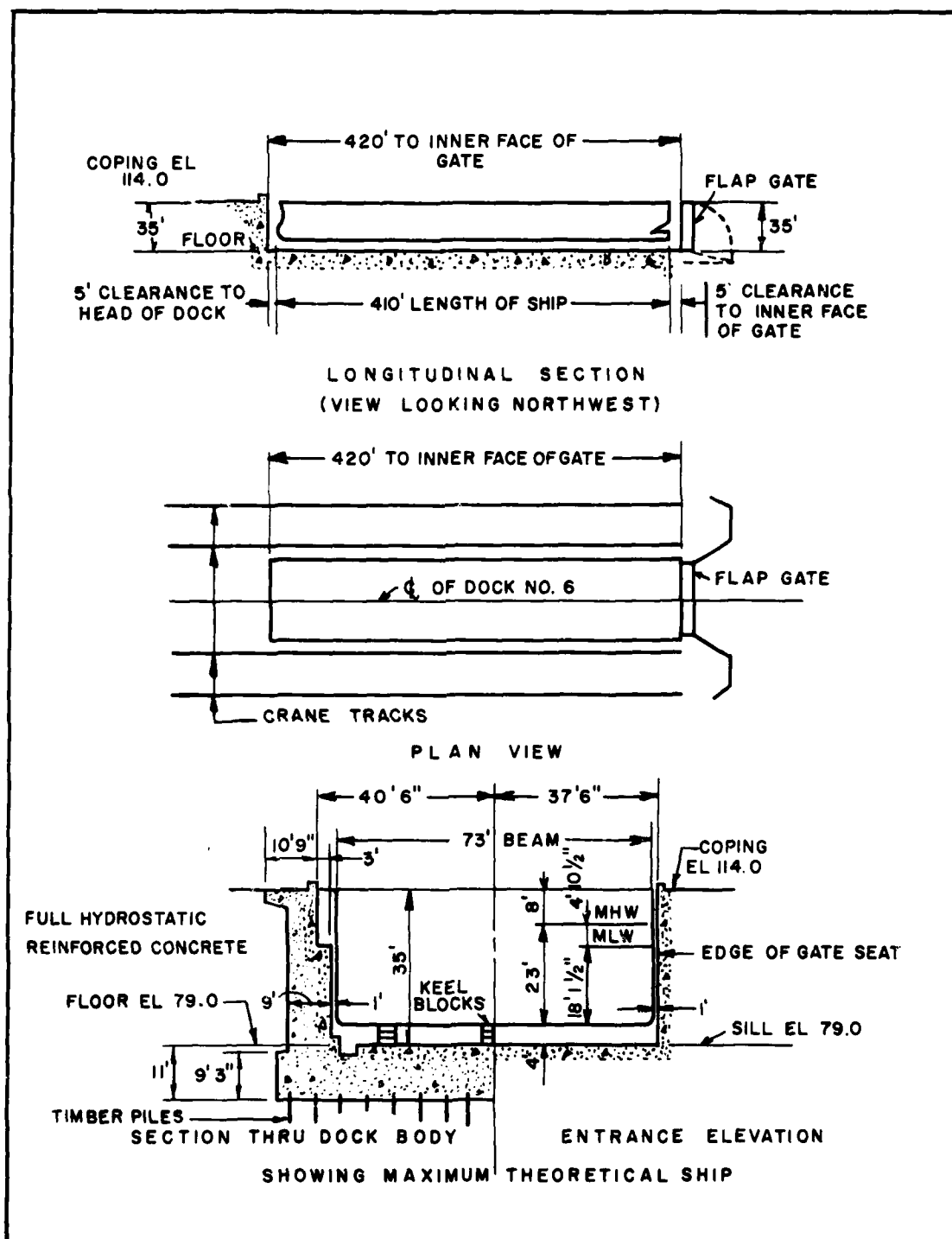


FIGURE 18
Hunters Point Naval Shipyard Drydock No. 6

Date Completed	Suitable for Docking	Foundation	Construction Material
1944	DD, SS	Piles	Concrete
Item	Data		
Closure	Flap gate, steel.		
Dewatering pumps ..	Four 24", 200 hp, 80,000 gpm. Time to dewater: 80 min.		
Drainage pumps	One 4", 7.5 hp, 450 gpm.		
Flooding	Through culverts. Time to flood: 50 min.		
Capstans	1 total: at head, 30 fpm at 16k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	12.9 lg tons	100'5"	
Auxiliary ..	5.4 lg tons	121'7"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	3,600	1 north side at 400 amps; 1 south side at 1,600 amps; 2 south side at 300 amps.
Item	Data		
Fresh water	4" and 6" mains, 200 gpm at 40 psi, two 2-1/2" and two 1-1/2" outlets each side.		
Salt water	6" mains, 1,500 gpm at 100 psi, three 4" and five 2-1/2" outlets each side. 4" header at dock floor with outlets.		
Fire protection ...	Same as salt water.		
Low pressure air ..	4" mains, 4,000 cfm at 100 psi, three 3" outlets each side. 3" header at dock floor with outlets.		
High pressure air .	1" mains, 150 cfm at 3,000 psi, one 1" outlet each side.		
Steam	4" and 6" mains, 5,000 phr at 100 psi, three 3" outlets each side.		
Sanitary sewer	6" mains, 600 gpm, ten 6" inlets each side.		
Natural gas	3" mains, 15 psi, one 2-1/2" outlet each side.		

FIGURE 18 (Continued)
 Hunters Point Naval Shipyard Drydock No. 6

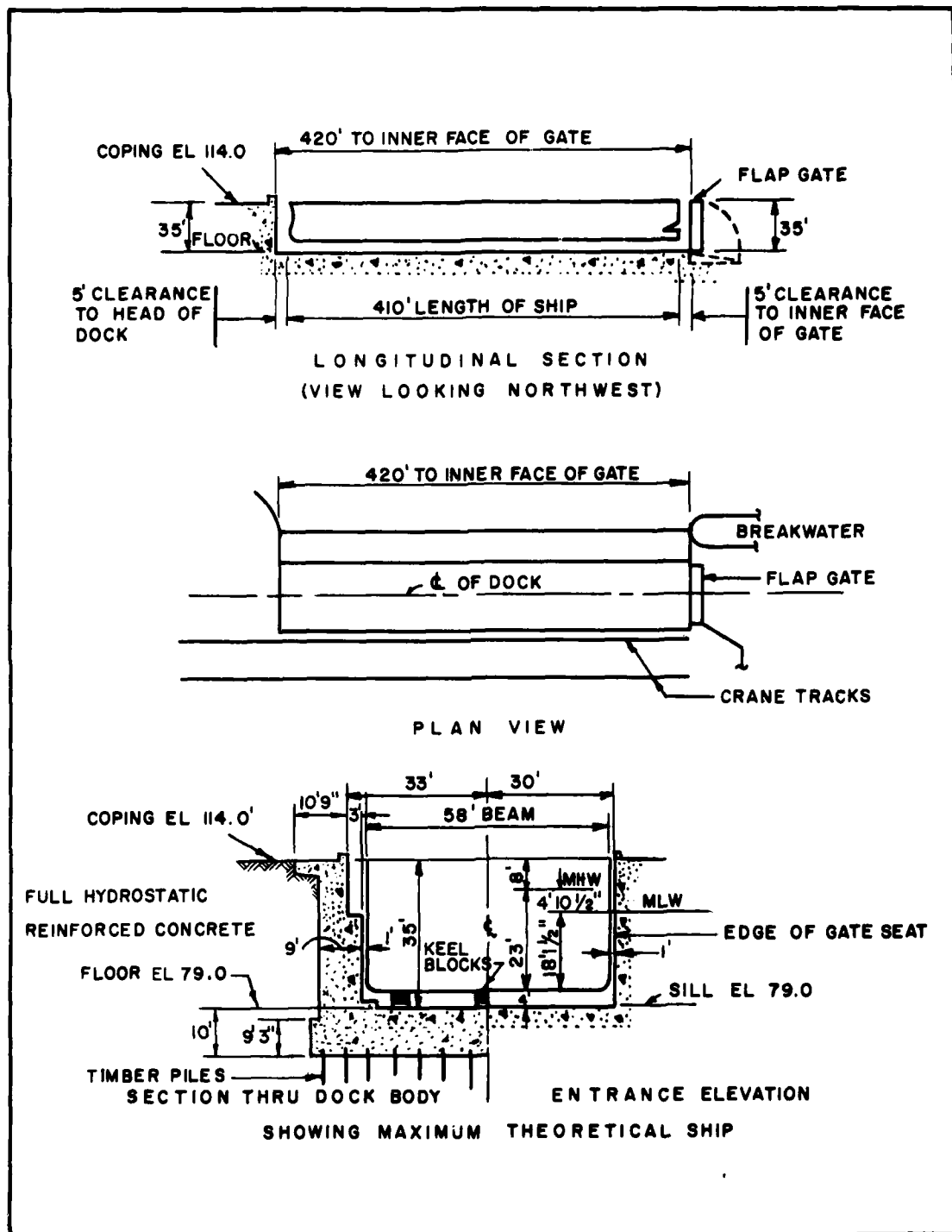


FIGURE 19
Hunters Point Naval Shipyard Drydock No. 7

Date Completed	Suitable for Docking	Foundation	Construction Material
1944	DD, SS	Piles	Concrete
Item	Data		
Closure	Flap gate, steel.		
Dewatering pumps ..	Four 24", 200 hp, 80,000 gpm. Time to dewater: 75 min.		
Drainage pumps	One 4", 7.5 hp, 450 gpm.		
Flooding	Through culverts. Time to flood: 45 min.		
Capstans	1 total: at head, 30 fpm at 16k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	17 lg tons	105'7"	
Auxiliary ..	5.4 lg tons	126'2"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	2,400	2 each side at 200 amps; 1 south side at 1,600 amps.
Item	Data		
Fresh water	4" and 6" main, 200 gpm at 40 psi, two 2-1/2" and two 2" outlets south side.		
Salt water	6" main, 1,500 gpm at 100 psi, three 4" outlets south side. 4" header at dock floor with outlets.		
Fire protection ...	Same as salt water		
Low pressure air ..	4" main, 4,000 cfm at 100 psi, three 3" outlets south side.		
High pressure air .	1" main, 150 cfm at 3,000 psi, one 1" outlet south side.		
Steam	4" and 6" main, 5,000 phr at 100 psi, three 3" outlets south side.		
Sanitary sewer	6" mains, 600 gpm, ten 6" inlets each side.		
Natural gas	3" main, 15 psi, one 2-1/2" outlet south side.		

FIGURE 19 (Continued)
Hunters Point Naval Shipyard Drydock No. 7

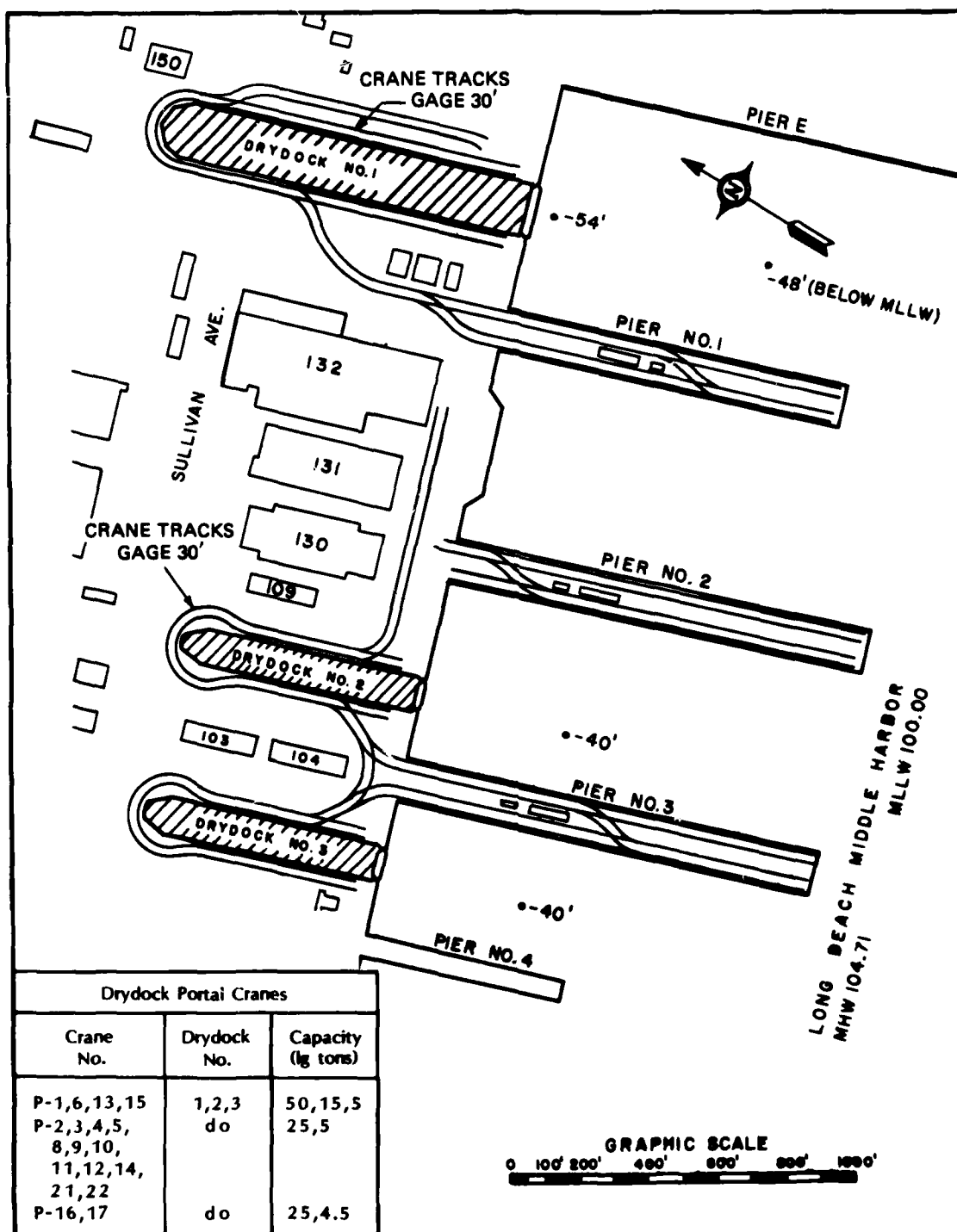


FIGURE 20

Location of Drydocks, Long Beach Naval Shipyard, Long Beach, California

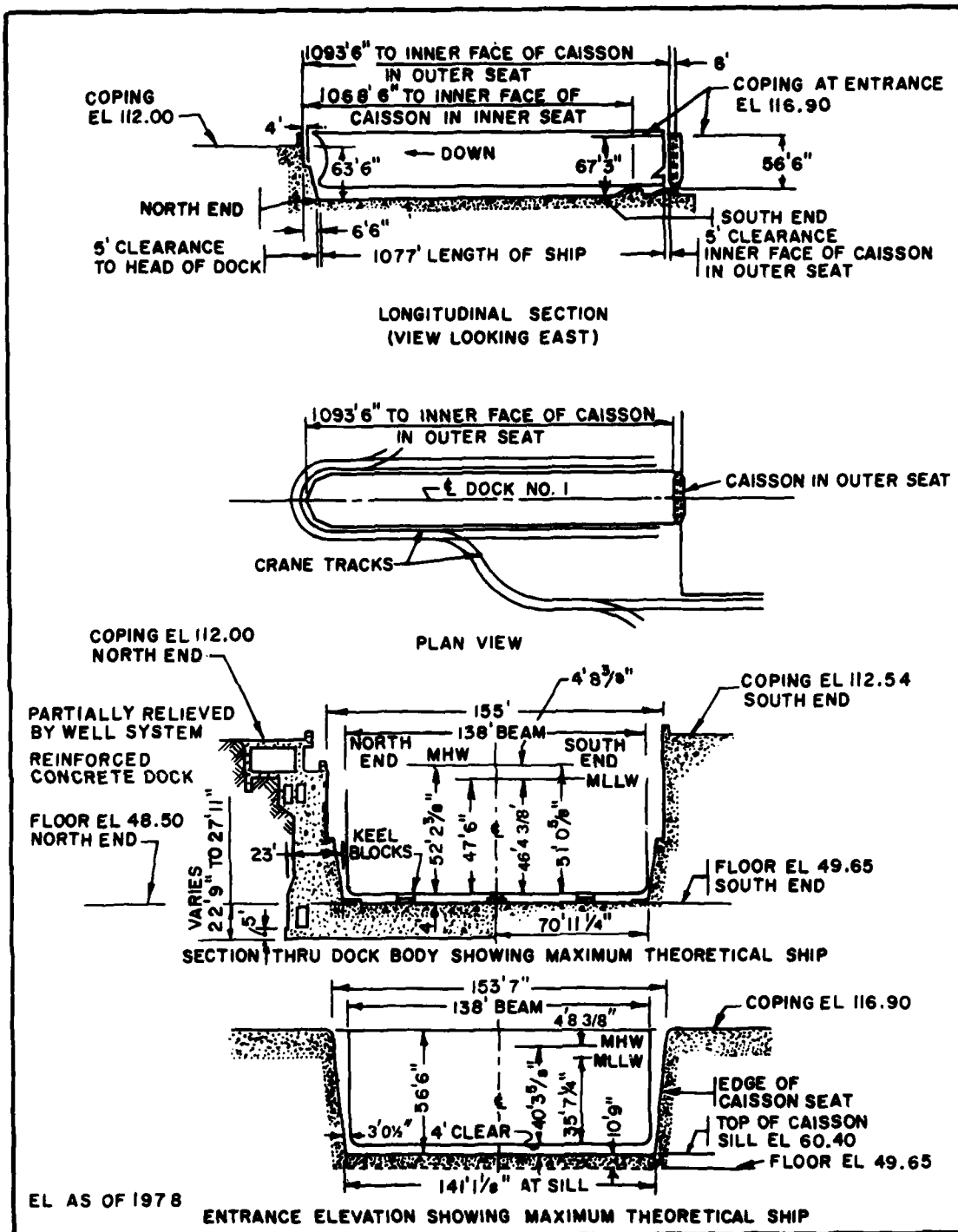


FIGURE 21
 Long Beach Naval Shipyard Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	CV	Earth	Concrete
Closure	Caisson, steel (rectangular box type). Spare caisson, reinforced concrete (rectangular box type).		
Dewatering pumps ..	Sixteen 20", 250 hp, 169,000 gpm; sixteen 20", 150 hp, 126,000 gpm; six 20", 85 hp, 30,000 gpm. Time to dewater: 240 min.		
Drainage pumps	Four 20", 200 hp, 28,000 gpm.		
Flooding	Through culverts. Time to flood: 135 min.		
Capstans	13 total: 1 at head, 1 each side of entrance, 30 fpm at 30k; 5 each side, 30 fpm at 15k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	90'0"	
Auxiliary ..	15 lg tons	126'0"	
Whip	5 lg tons	157'0", 108'0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	15,600	Three 2,500 amp bus each side; 6 east side and 19 west side at 400 amps; 3 east side and 7 west side at 100 amps.
Fresh water	6" mains, 1,000 gpm at 50 psi, two 4" and three 2-1/2" outlets each side.		
Salt water	8" and 12" mains, 5,000 gpm at 120 psi, two 6" and four 4" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 4,000 cfm at 100 psi, two 4" and four 2-1/2" outlets each side. 8" headers at dock floor.		
Steam	6" mains, 36,000 phr at 180 psi, two 3" and four 2" outlets each side.		
Oxygen	2" mains, 180 cfm at 100 psi, two 1-1/2" outlets each side, three 1" east side, four 1" west side.		
Acetylene	2" mains, 180 cfm at 11 psi, one 1-1/2" outlet east side, two 1-1/2" outlets west side, four 1" outlets each side.		
Sanitary sewer	8" mains, 1,200 gpm, twenty-six 6" inlets each side.		
CHT sewer	4" to 12" mains, 1,230 gpm, seven 4" inlets each side.		
Natural gas	3" mains, 200 cfm at 15 psi, five 1-1/2" outlets east side, six 1-1/2" outlets west side.		

FIGURE 21 (Continued)
Long Beach Naval Shipyards Drydock No. 1

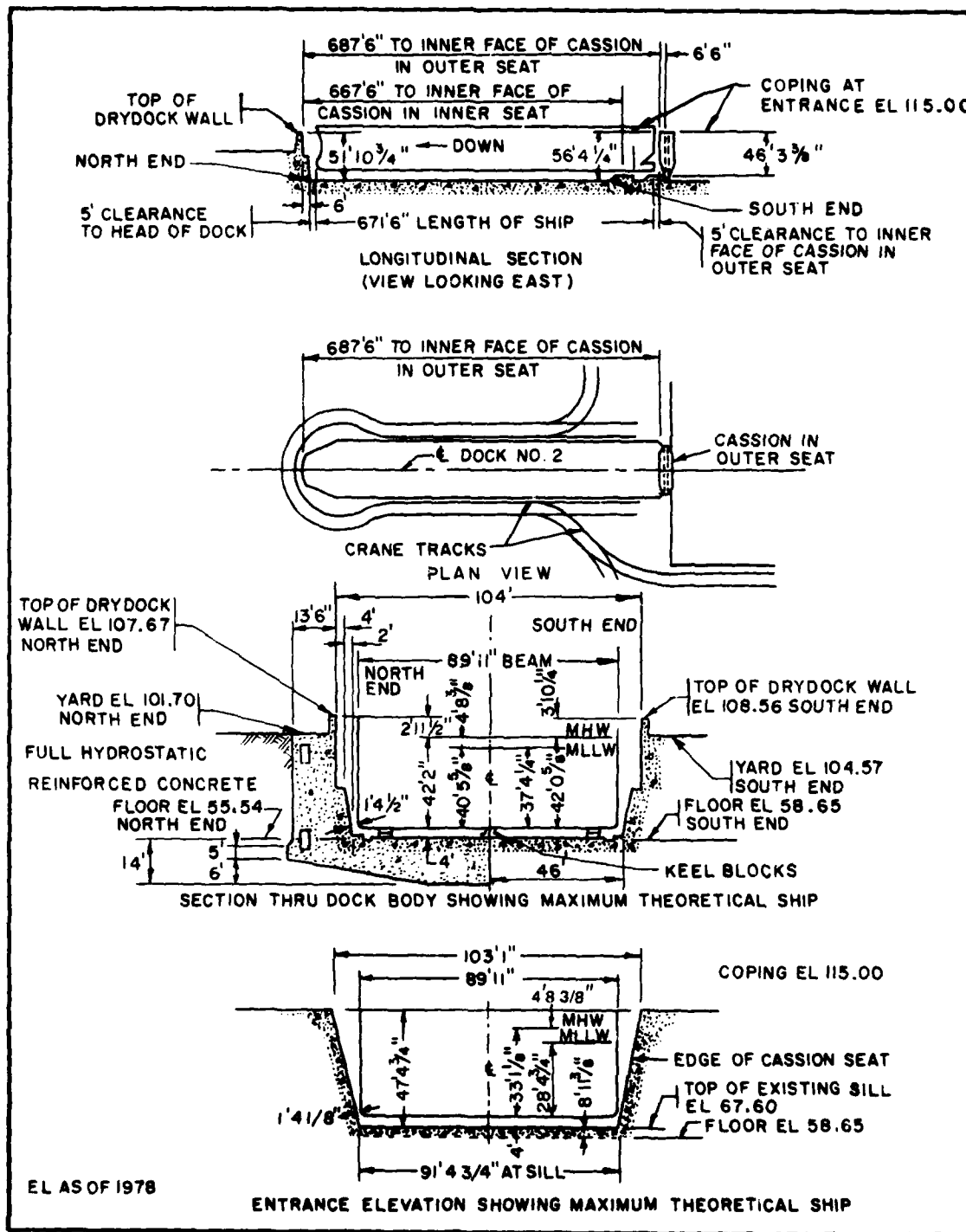


FIGURE 22
 Long Beach Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1943	CG	Earth	Concrete
Closure	Caisson, steel (rectangular box type). Spare caisson, reinforced concrete (rectangular box type), also used for Drydock No. 3.		
Dewatering pumps ..	Six 36", 300 hp, 78,000 gpm; four 30", 300 hp, 55,200 gpm. Time to dewater: 135 min.		
Drainage pumps	One 12", 75 hp, 3,000 gpm.		
Flooding	Through culverts. Time to flood: 90 min.		
Capstans	7 total: 1 at head, 1 each side of entrance, 30 fpm at 30k; 2 each side, 30 fpm at 15k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	106'0"	
Auxiliary ..	15 lg tons	133'6"	
Whip	5 lg tons	157'0", 108'0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	5,400	1500 amp bus each side; 6 each side at 400 amps; 1 west side of entrance at 200 amps.
Fresh water	8" mains, 1,000 gpm at 50 psi, six 2-1/2" outlets each side.		
Salt water	8" mains, 1,200 gpm at 120 psi, four 2-1/2" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 5,000 cfm at 100 psi, four 2-1/2" outlets each side. 4" headers at dock floor with outlets.		
Steam	6" mains, 18,000 phr at 180 psi, four 2-1/2" outlets each side.		
Oxygen	1-1/2" mains, 300 cfm at 100 psi, four 1" outlets each side.		
Acetylene	1-1/2" mains, 140 cfm at 11 psi, four 1" outlets each side.		
Sanitary sewer	8" mains, 550 gpm, thirty 6" inlets each side.		
CHT sewer	4" and 6" mains, 1,040 gpm, four 4" inlets each side.		
Natural gas	2-1/2" mains, 150 cfm at 15 psi, four 1-1/2" outlets each side.		

FIGURE 22 (Continued)
Long Beach Naval Shipyard Drydock No. 2

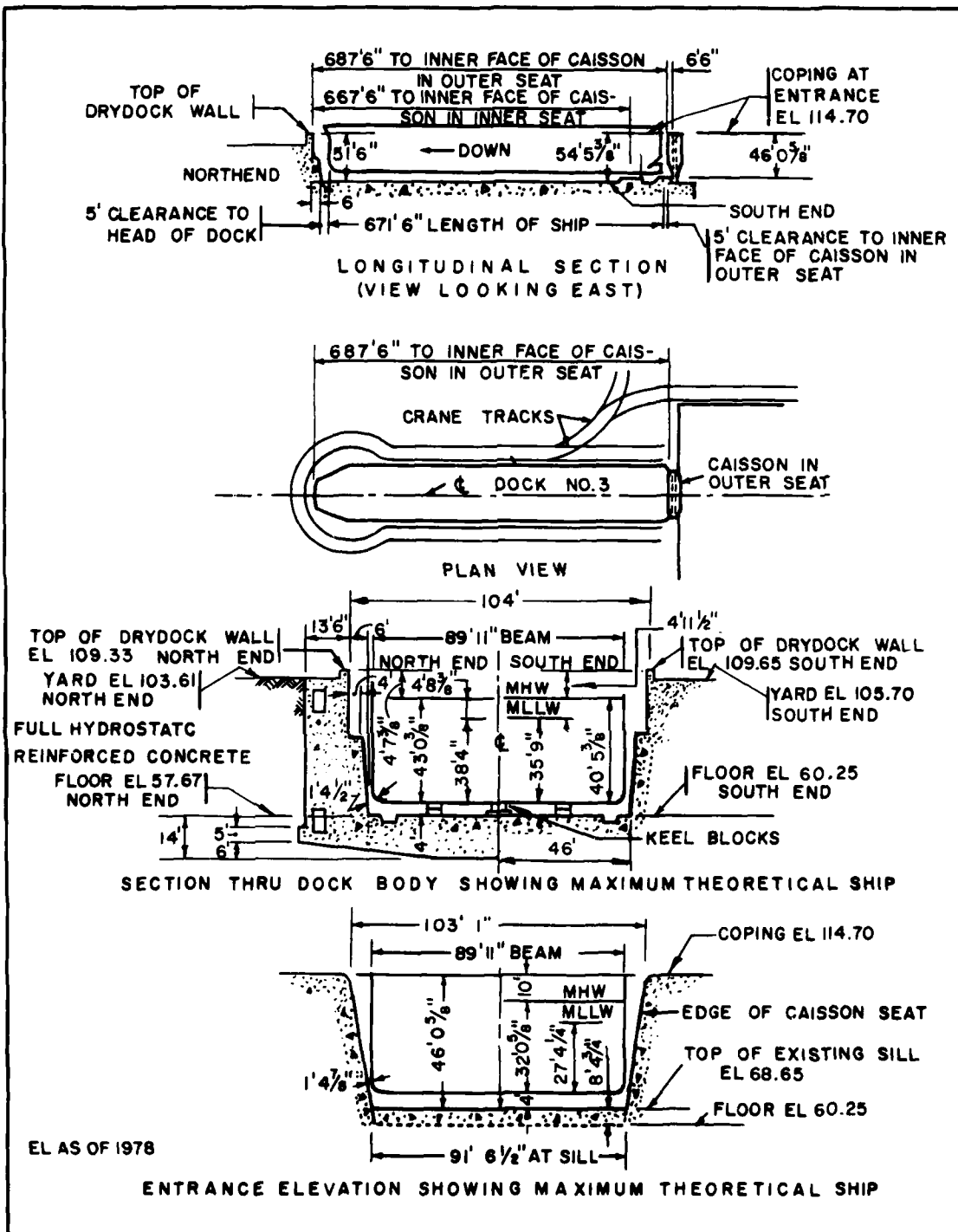


FIGURE 23
Long Beach Naval Shipyard Drydock No. 3

Date Completed	Suitable for Docking	Foundation	Construction Material
1943	CG	Earth	Concrete
Closure	Caisson, steel (rectangular box type). Spare caisson, reinforced concrete (rectangular box type), also used for Drydock No., 2.		
Dewatering pumps ..	Six 36", 300 hp, 78,000 gpm; four 30", 300 hp, 55,200 gpm. Time to dewater: 135 min.		
Drainage pumps	One 12", 75 hp, 3,000 gpm.		
Flooding	Through culverts. Time to flood: 90 min.		
Capstans	7 total: 1 at head, 1 each side of entrance, 30 fpm at 30k; 2 each side, 30 fpm at 15k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	106'0"	
Auxiliary ..	15 lg tons	133'6"	
Whip	5 lg tons	157'0", 108'0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	5,400	1500 amp bus each side; 7 each side at 400 amps; 1 east side of entrance at 200 amps.
Fresh water	6" mains, 1,000 gpm at 50 psi, six 2-1/2" outlets each side.		
Salt water	8" mains, 1,200 gpm at 120 psi, four 2-1/2" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 5,000 cfm at 100 psi, four 2-1/2" outlets each side. 4" headers at dock floor with outlets.		
Steam	6" mains, 18,000 phr at 180 psi, four 2-1/2" outlets each side.		
Oxygen	1-1/2" mains, 300 cfm at 100 psi, four 1" outlets each side.		
Acetylene	1-1/2" mains, 140 cfm at 11 psi, four 1" outlets each side.		
Sanitary sewer	8" mains, 550 gpm, thirty 6" inlets each side.		
CHT sewer	4" and 6" mains, 1,040 gpm, four 4" inlets each side.		
Natural gas	2-1/2" mains, 150 cfm at 15 psi, four 1-1/2" outlets each side.		

FIGURE 23 (Continued)
Long Beach Naval Shipyard Drydock No. 3

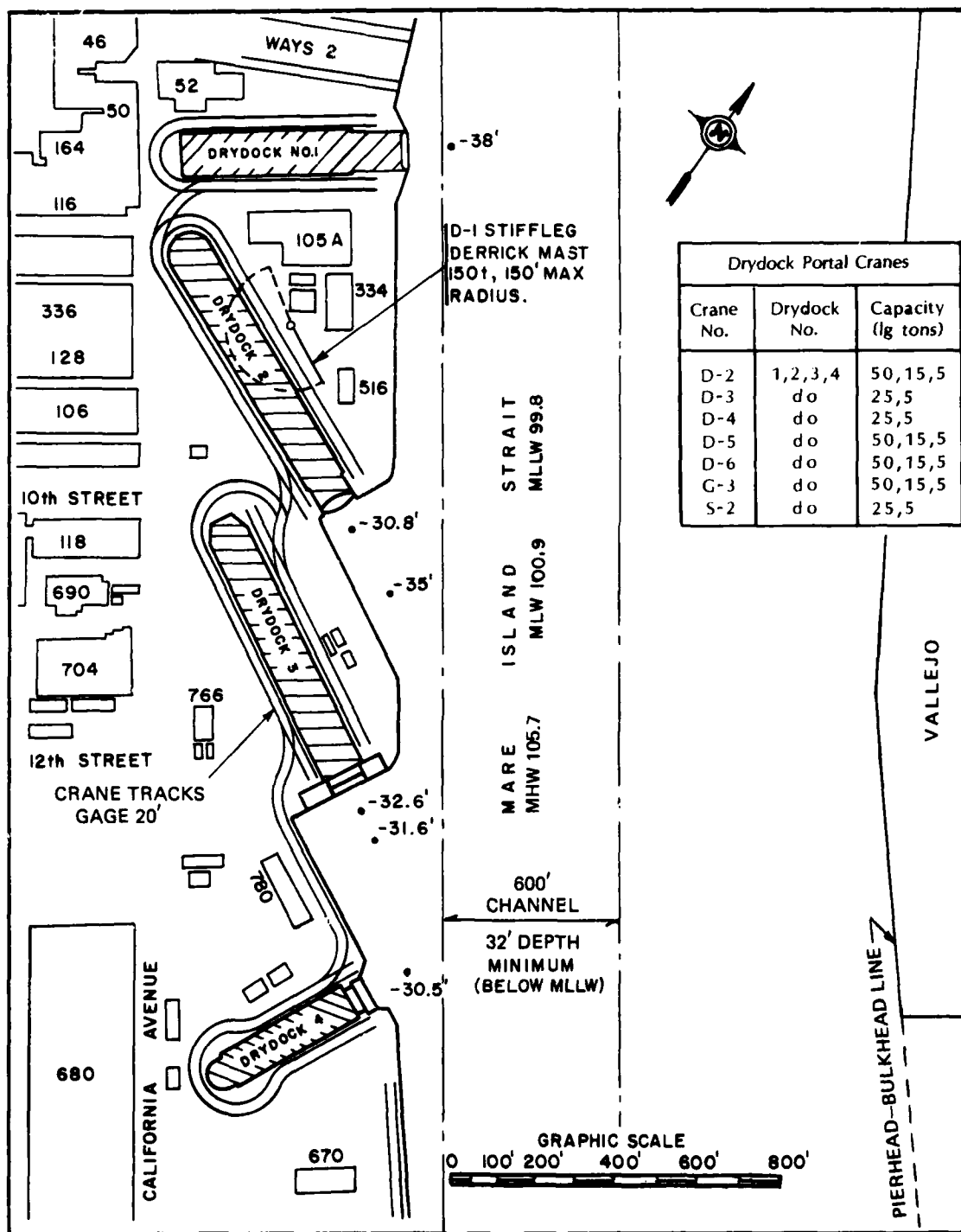


FIGURE 24
Location of Drydocks, Mare Island Naval Shipyard, Vallejo, California

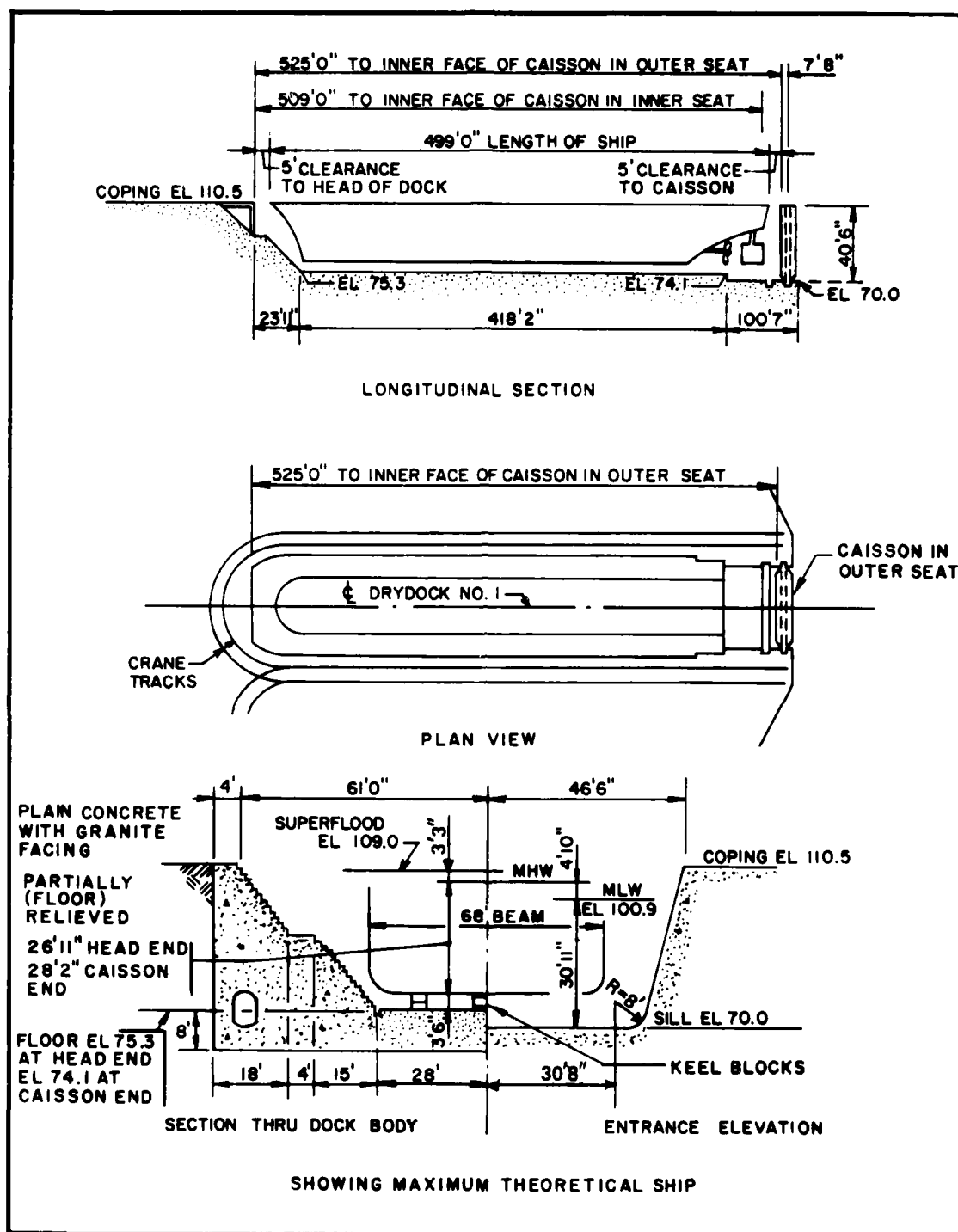


FIGURE 25
Mare Island Naval Shipyard Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1891	SSBN	Earth	Concrete and granite
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Two 54", 550 hp, 198,400 gpm. Pumps also used for Drydock No. 2.		
	Time to dewater: 75 min.		
Drainage pumps	Two 3", 20 hp, 2,000 gpm; two 12", 60 hp, 7,000 gpm.		
	Pumps also used for Drydock No. 2.		
Flooding	Through caisson. Time to flood: 90 min. Superflooding pumps: two 36", 150 hp, 72,000 gpm.		
Capstans	5 total: 1 at head, 1 each side, 30 fpm at 20k; 1 each side of entrance, 30 fpm at 10k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	112'6"	
Auxiliary ..	15 lg tons	135'5"	
Whip	5 lg tons	123'8", 115'6" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	4,200	1 south side at 4,000 amps.
Ac, 3 Ph, 60 Hz ..	460	1,200	1 south side at 1,200 amps.
Ac, 3 Ph, 60 Hz ..	460	2,400	North side: 4-400a, 6-200a, 24-100a; South side: 3-800a, 8-200a, 32-100a.
Fresh water	8" mains, 1,600 gpm at 60 psi, one 2-1/2" and two 1-1/2" outlets north side, one 3" and 2" south side.		
Pure water	2" main, 50 gpm at 60 psi, one 2" outlet north side.		
Salt water	6" and 8" mains, 1,200 gpm at 100 psi, three 2-1/2" and nine 1-1/2" outlets north side, seventeen 2-1/2" outlets south side.		
Fire protection ...	Same as salt water.		
Low pressure air ..	4" and 6" mains, 5,000 cfm at 90 psi, nine 2-1/2" and twenty-five 1-1/4" outlets north side, eight 2-1/2" and twenty 1-1/4" outlets south side.		
High pressure air .	1-1/2" main, 0.75 cfm at 5,000 psi, one 1/2" outlet north side.		
Steam	4" and 8" mains, 3,500 phr at 150 psi, one 1-1/4" outlet north side and one 1-1/2" outlet south side.		
Sanitary sewer	4" and 8" mains, 1,200 gpm, four 4" inlets each side.		

FIGURE 25 (Continued)
Mare Island Naval Shipyard Drydock No. 1

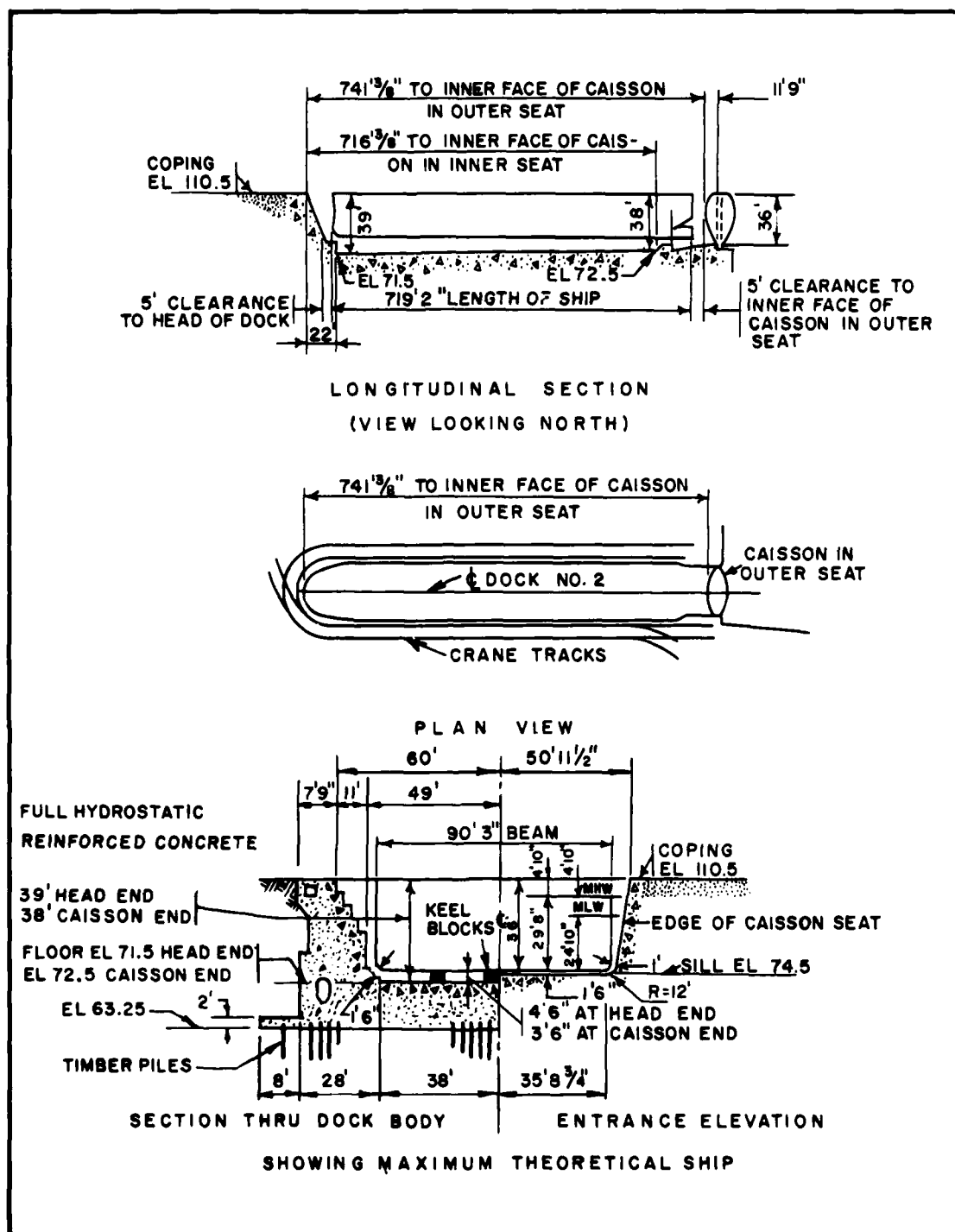


FIGURE 26
 Mare Island Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1910	CGN, SSBN	Piles	Concrete
Item	Data		
Closure	Caisson, steel (ship type).		
Dewatering pumps ..	Two 54", 550 hp, 198,400 gpm. Pumps also used for Drydock No. 1. Time to dewater: 140 min.		
Drainage pumps	Two 3", 20 hp, 2,000 gpm; two 12", 60 hp, 7,000 gpm. Pumps also used for Drydock No. 1.		
Flooding	Through caisson and culverts. Time to flood: 75 min.		
Capstans	7 total: 1 at head, 1 each side of entrance, 30 fpm at 20k; 2 each side, 34 fpm at 11k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	113'10"	
Auxiliary ..	15 lg tons	135'5"	
Whip	5 lg tons	123'8", 115'6" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	4,200	1 south side at 4,000 amps.
Ac, 3 Ph, 60 Hz ..	460	3,600	3 north side at 800 amps; 3 south side at 400 amps; 12 each side at 200 amps; 48 each side at 100 amps.
Item	Data		
Fresh water	4" mains, 750 gpm at 60 psi, five 2-1/2" outlets each side.		
Salt water	6" mains, 1,500 gpm at 100 psi, seven 3" and sixteen 2-1/2" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	4" mains, 4,000 cfm at 90 psi, three 2-1/2" and twenty-six 1-1/2" outlets each side.		
Steam	3" mains, 10,000 phr at 150 psi, six 2" outlets.		
Sanitary sewer	8" mains, 1,050 gpm, five 4" inlets each side.		

FIGURE 26 (Continued)
Mare Island Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1940	CGN, SSBN	Piles	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Two 54", 800 hp, 200,000 gpm. Pumps also used for Drydock No. 4.		
	Time to dewater: 160 min.		
Drainage pumps	Two 12", 225 hp, 11,000 gpm. Pumps also used for Drydock No. 4.		
Flooding	Through culverts. Time to flood: 85 min.		
Capstans	7 total: 1 at head, 30 fpm at 25k; 1 each side of entrance, 30 fpm at 24k; 2 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	113'10"	
Auxiliary ..	15 .g tons	135'5"	
Whip	5 lg tons	123'8", 115'6" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	4,200	2 north side at 4,000 amps.
Ac, 3 Ph, 60 Hz ..	460	1,400	3 north side at 800 amps; 3 south side at 400 amps.
Item	Data		
Fresh water	6" mains, 1,000 gpm at 60 psi, ten 2-1/2" and eight 1-1/2" outlets each side, one 3/4" outlet south side.		
Salt water	6" and 8" mains, 1,800 gpm at 100 psi, twenty-one 2-1/2" and one 1-1/2" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 3,300 cfm at 90 psi, eight 2-1/2", nine 1-1/2" and eight 3/4" outlets each side. 4" header at dock floor with outlets.		
Steam	4" mains, 8,000 phr at 150 psi, one 2", four 1-1/2", three 1" and four 3/4" outlets each side.		
Sanitary sewer	8" mains, 1,000 gpm, five 4" inlets each side.		

FIGURE 27 (Continued)
Mare Island Naval Shipyard Drydock No. 3

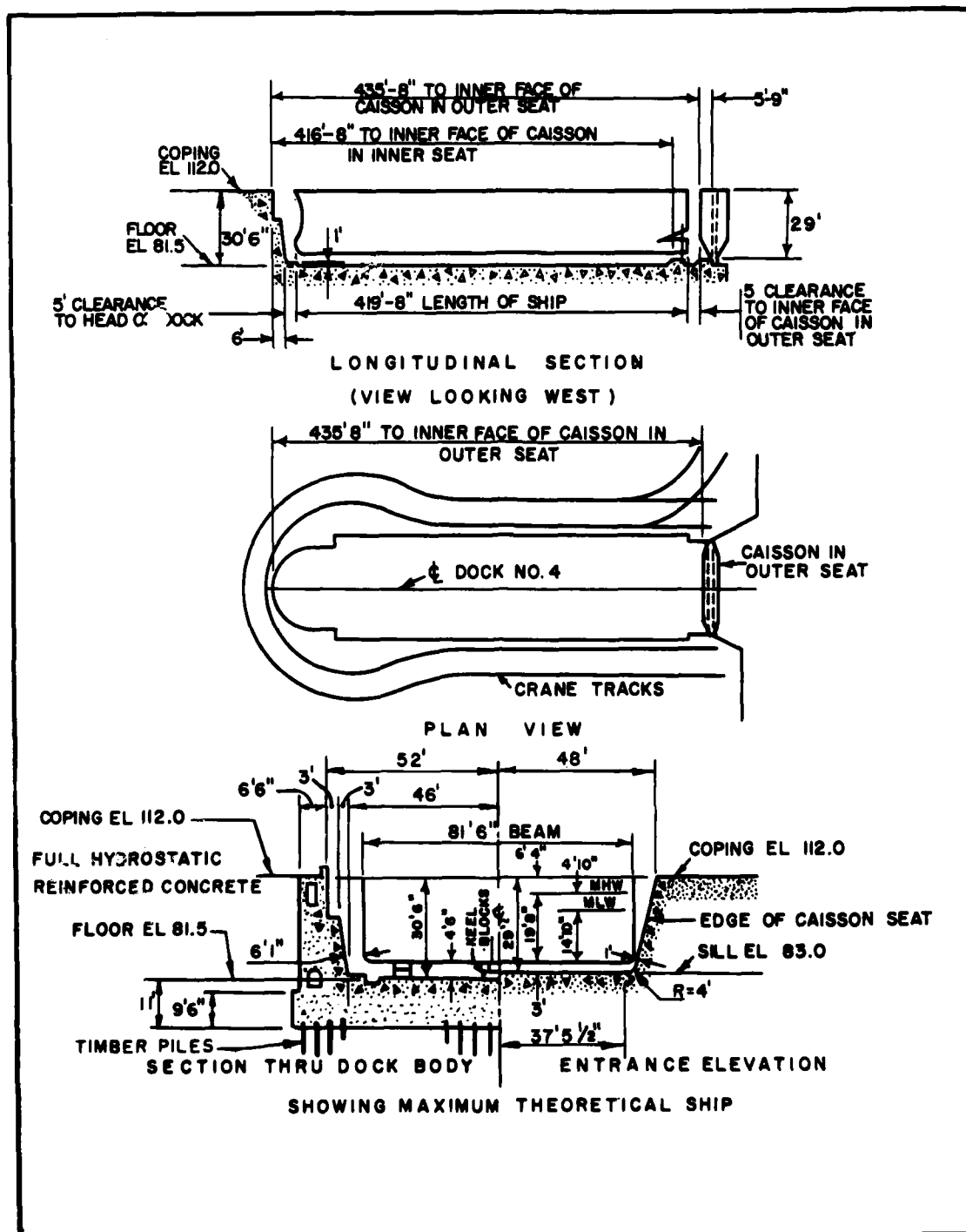


FIGURE 28
Mare Island Naval Shipyard Drydock No. 4

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	DD, SSN	Piles	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Two 54", 800 hp, 200,000 gpm (Drydock No. 3 pumphouse). Time to dewater: 75 min.		
Drainage pumps	Two 12", 225 hp, 11,000 gpm (Drydock No. 3 pumphouse).		
Flooding	Through culverts. Time to flood: 45 min.		
Capstans	5 total: 1 at head, 30 fpm at 24k; 1 each side of entrance, 1 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	117'8"	
Auxiliary ..	15 lg tons	135'5"	
Whip	5 lg tons	123'8", 115'6" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	4,200	1 south side at 4,000 amps.
Ac, 3 Ph, 60 Hz ..	460	900	3 each side at 400 amps; 6 each side at 200 amps; 24 each side at 100 amps.
Item	Data		
Fresh water	4" mains, 750 gpm at 60 psi, six 2-1/2" outlets each side, four 1-1/2" outlets south side.		
Salt water	6" mains, 1,000 gpm at 100 psi, six 2-1/2" outlets north side, six 1-1/2" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	4" mains, 3,000 cfm at 90 psi, ten 2-1/2", one 1-1/2" and eleven 1-1/4" outlets north side, twelve 2-1/2", four 1-1/2" and fourteen 1-1/4" outlets south side.		
Steam	3" mains, 10,000 phr at 150 psi, one 2" and five 1-1/2" outlets north side, six 1-1/2" outlets south side.		
Sanitary sewer	8" mains, 880 gpm, four 4" inlets each side.		

FIGURE 28 (Continued)
Mare Island Naval Shipyard Drydock No. 4

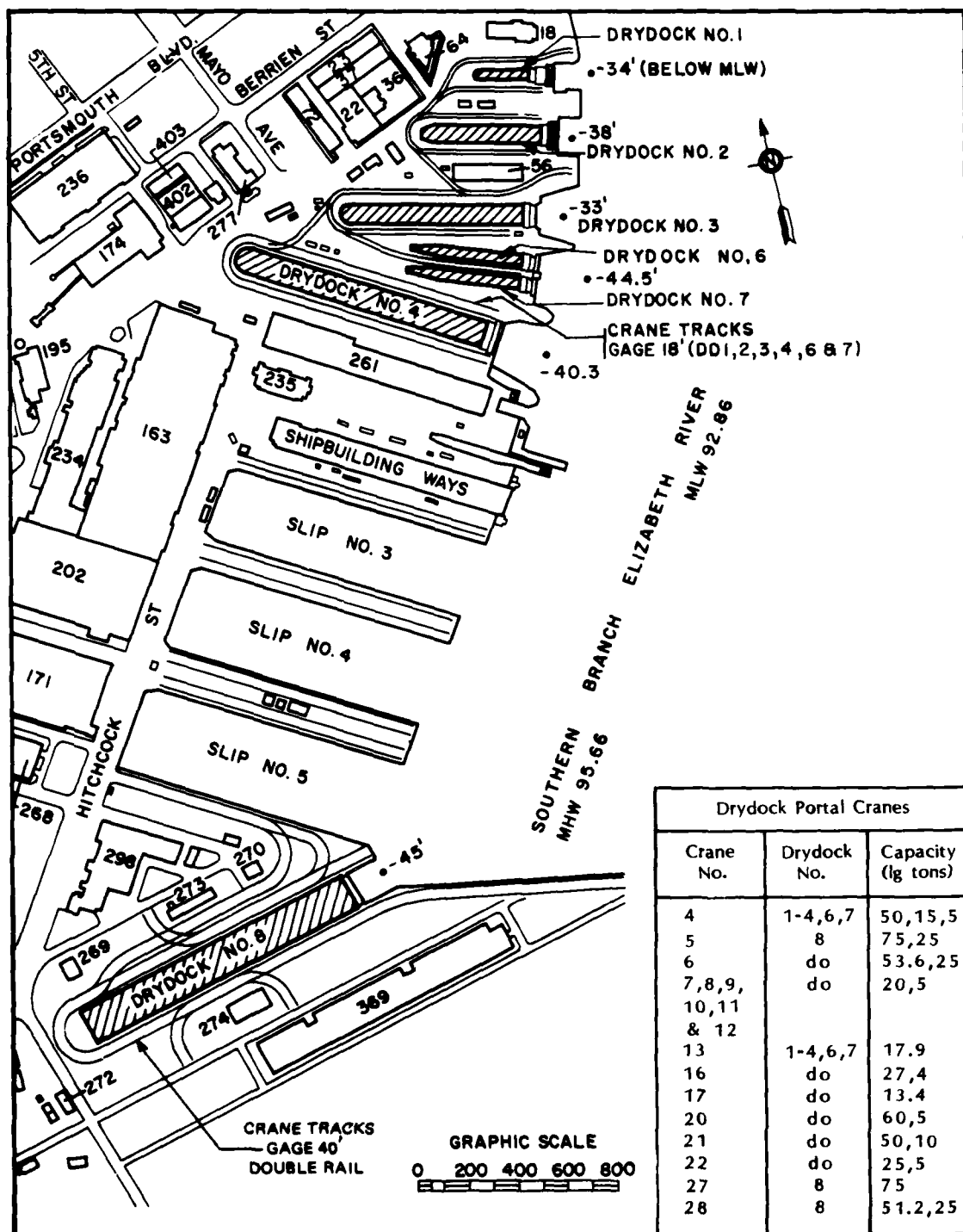


FIGURE 29
Location of Drydocks, Norfolk Naval Shipyard, Portsmouth, Virginia

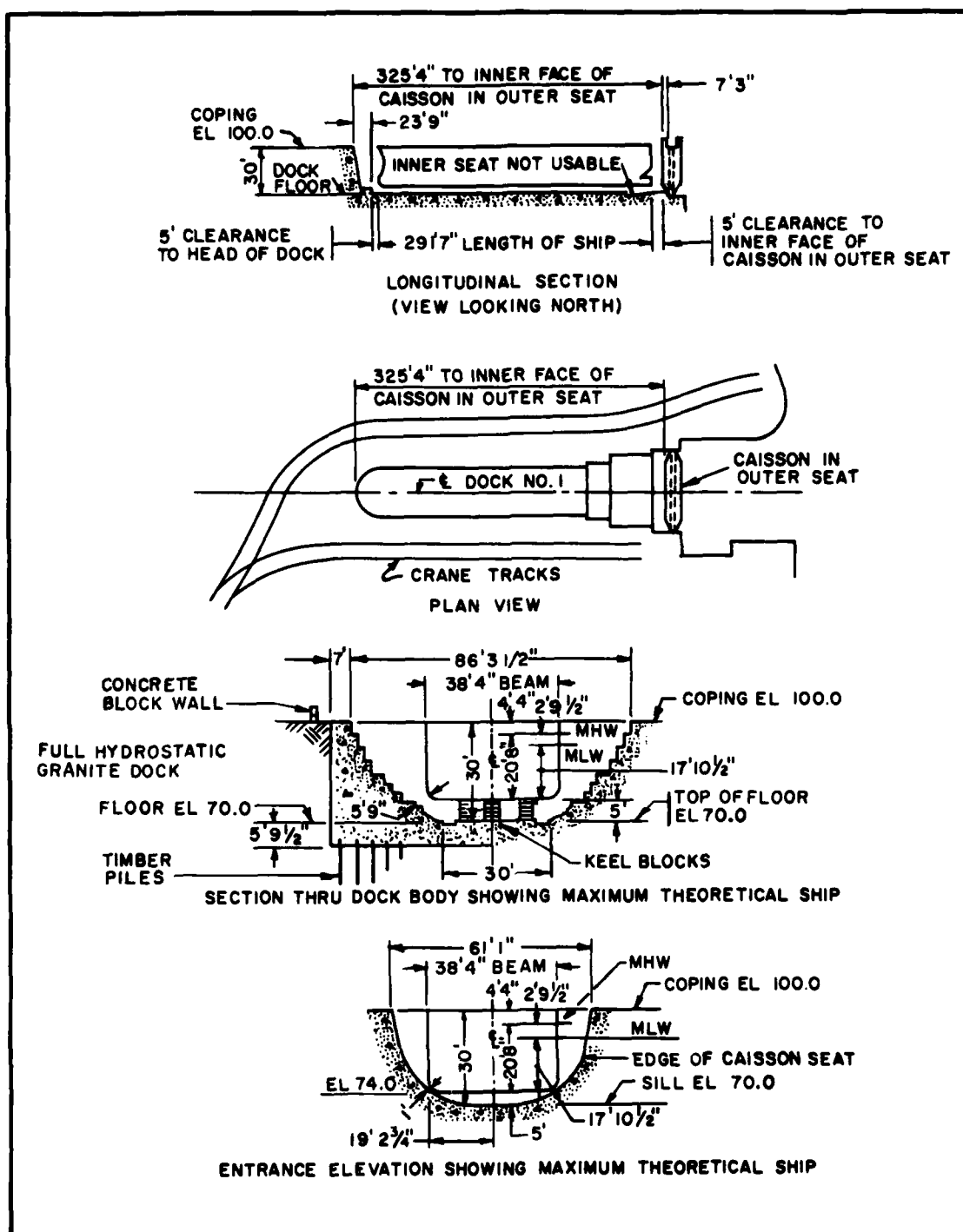


FIGURE 30
Norfolk Naval Shipyard Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1833	Service craft	Piles	Granite
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	One 42", 600 hp, 45,000 gpm; one 42", 600 hp, 50,000 gpm; one 42", 800 hp, 96,000 gpm (Drydock No. 2 pumphouse). Time to dewater: 60 min.		
Drainage pumps	Two 12", 125 hp, 9,000 gpm (Drydock No. 2 pumphouse).		
Flooding	Through caisson. Time to flood: 45 min.		
Capstans	4 total: 1 at head, 30 fpm at 30k; 1 each side of entrance, 1 south side at head, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	60 lg tons	100'7"	
Whip	5 lg tons	151'7", 64'0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	400	3 south side at 400 amps.
Item	Data		
Fresh water	6" mains, 300 gpm at 55 psi, one 2-1/2" outlet each side.		
Salt water	4" and 6" south and 6" north side mains, 500 gpm at 100 psi, one 2-1/2" outlet each side.		
Fire protection ...	Same as salt water.		
Compressed air	4" main, 1,500 cfm at 100 psi, sixteen 2" outlets south side.		
Steam	4" main, 8,000 phr at 100 psi, nine 2" outlets south side.		
Sanitary sewer	6" mains, nine 4" inlets each side.		

FIGURE 30 (Continued)
Norfolk Naval Shipyard Drydock No. 1

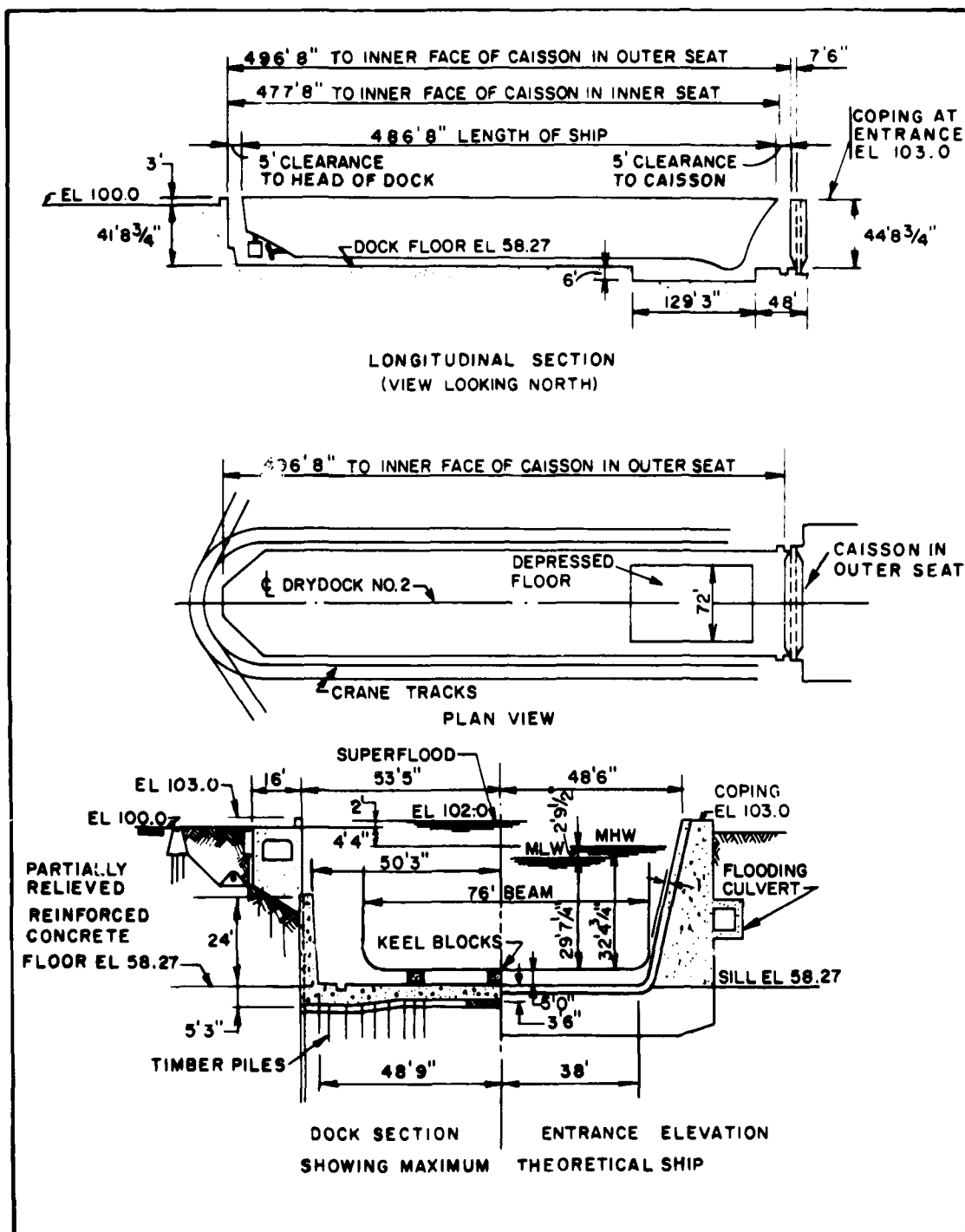


FIGURE 31
Norfolk Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1966	DD, SSBN	Piles	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	One 42", 600 hp, 45,000 gpm; one 42", 600 hp, 50,000 gpm; one 42", 800 hp, 96,000 gpm. Pumps also used for Drydocks No. 1 and 3.		
	Time to dewater: 135 min.		
Drainage pumps	Two 12", 125 hp, 9,000 gpm (also used for Drydocks No. 1 and 3); two 6", 18 hp, 1,000 gpm.		
Flooding	Through culvert. Time to flood: 75 min. Dewatering Pump No. 2 used to superflood.		
Capstans	4 total: 1 each side of entrance, 1 south side, 30 fpm at 30k; 1 north side (Drydock No. 1 capstan), 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	103'5"	
Auxiliary ..	10 lg tons	141'3"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	11,500	300	1 north side at 500 amps.
Ac, 3 Ph, 60 Hz ..	460	-	6 north side and 33 south side at 400 amps.
Item	Data		
Fresh water	4" mains, 520 gpm at 55 psi, five 2-1/2" outlets each side.		
Salt water	6" mains, 1,800 gpm at 100 psi, four 2-1/2" outlets north side, five 2-1/2" outlets south side.		
Fire protection ...	10" main, 2,400 gpm at 150 psi, six 4" and six 2-1/2" outlets south side.		
Compressed air	6" mains, 5,000 cfm at 100 psi, seventeen 2" outlets each side.		
Steam	6" main, 12,000 phr at 100 psi, ten 2" outlets north side.		
Sanitary sewer	8" main, fourteen 6" inlets each side.		

FIGURE 31 (Continued)
Norfolk Naval Shipyard Drydock No. 2

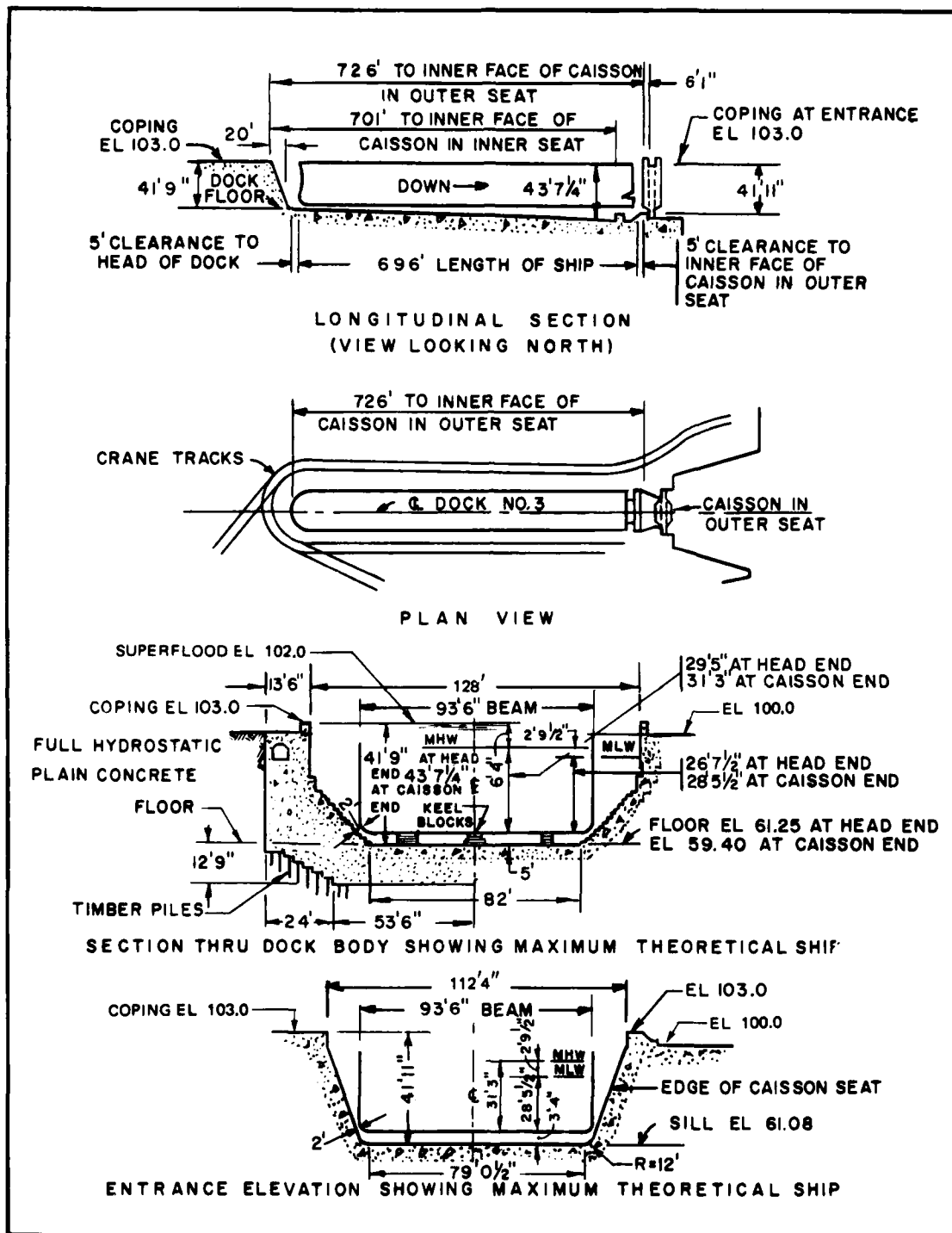


FIGURE 32
 Norfolk Naval Shipyard Drydock No. 3

Date Completed	Suitable for Docking	Foundation	Construction Material
1911	CGN, SSBN	Piles	Concrete and granite
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	One 42", 600 hp, 45,000 gpm; one 42", 600 hp, 50,000 gpm; one 42", 800 hp, 96,000 gpm (Drydock No. 2 pumphouse). Time to dewater: 135 min.		
Drainage pumps	Two 12", 125 hp, 9,000 gpm (Drydock No. 2 pumphouse).		
Flooding	Through caisson. Time to flood: 90 min. Dewatering Pump No. 2 (at Drydock No. 2 pumphouse) used to superflood.		
Capstans	11 total: 1 at head, 12 fpm at 35k; 2 each side of entrance, 4 north side, 1 south side, 7 fpm at 29k; 1 south side, 30 fpm at 30k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	104'9"	
Auxiliary ..	10 lg tons	142'4"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	11,500	300	1 south side at 500 amps.
Ac, 3 Ph, 60 Hz ..	460	3,200	25 north side and 14 south side at 400 amps.
Item	Data		
Fresh water	6" mains, 520 gpm at 55 psi, fourteen 2-1/2" outlets each side.		
Salt water	12" mains, 4,000 gpm at 150 psi, eight 4" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 6,500 cfm at 100 psi, thirty-two 2" outlets each side. 4" headers at dock floor with outlets.		
Steam	4" and 6" north and 4" south side mains, 20,000 phr at 100 psi, fourteen 2" outlets each side.		
CHT sewer	8" mains, sixteen 4" inlets each side.		

FIGURE 32 (Continued)
Norfolk Naval Shipyard Drydock No. 3

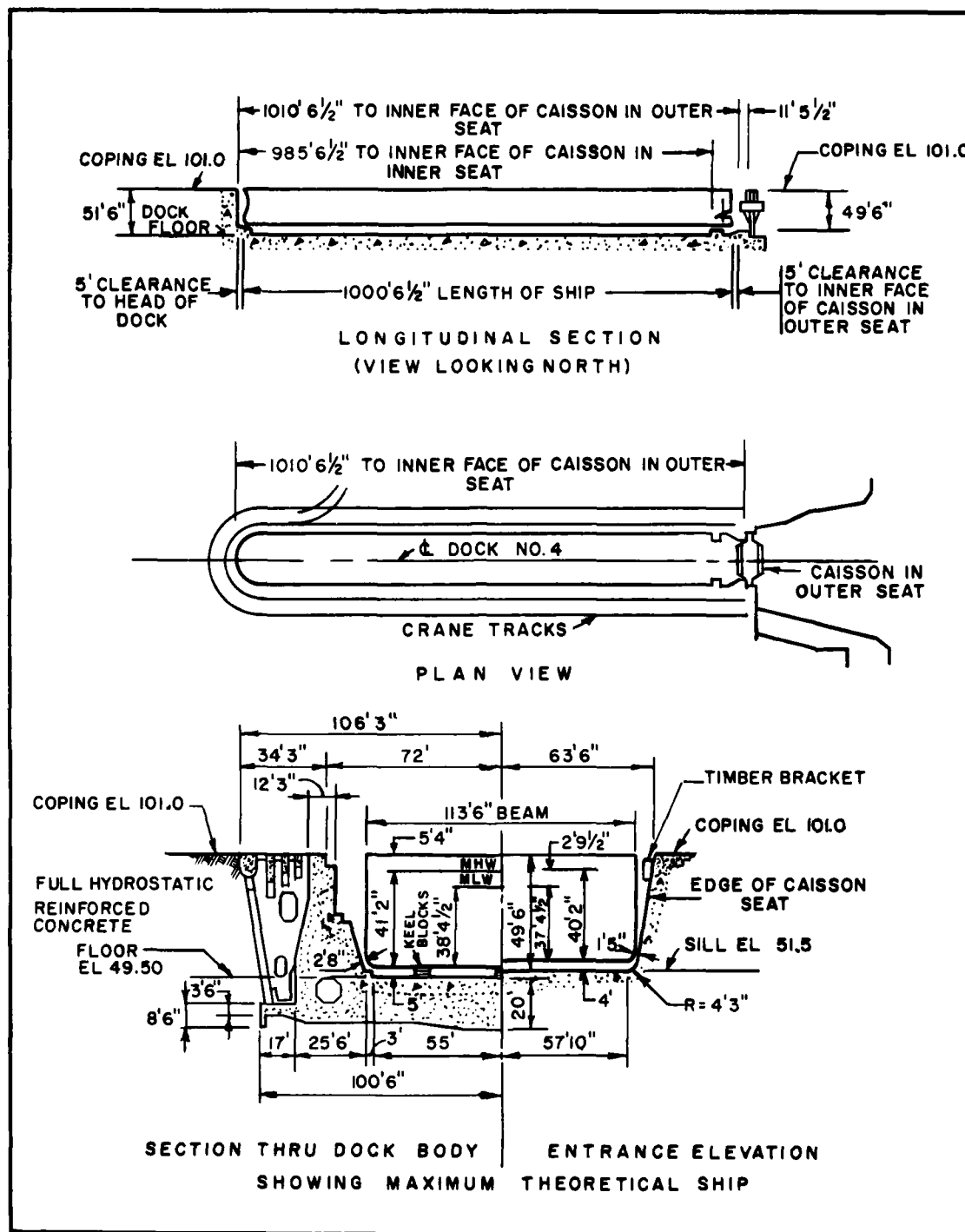


FIGURE 33
Norfolk Naval Shipyard Drydock No. 4

Date Completed	Suitable for Docking	Foundation	Construction Material
1919	CV	Earth	Concrete
Item	Data		
Closure	Caisson, steel (hydrometer type). Spare caisson, steel (hydrometer type).		
Dewatering pumps ..	Three 54", 1,250 hp, 330,000 gpm. Pumps also used for Drydocks No. 6 and 7. Time to dewater: 135 min.		
Drainage pumps	Two 12", 150 hp, 10,000 gpm. Pumps also used for Drydocks No. 6 and 7.		
Flooding	Through culverts. Time to flood: 105 min.		
Capstans	13 total: 1 at head, 1 each side of entrance, 1 at Berths 19 and 20, 2 north side, 3 south side, 50 fpm at 30k; 2 north side, 1 south side, 7 fpm at 29k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	97'0", 90'0" max radius	
Auxiliary ..	10 lg tons	128'4"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	11,500	600	2 south side at 500 amps.
Ac, 3 Ph, 60 Hz ..	460	3,200	28 north side and 17 south side at 400 amps.
Item	Data		
Fresh water	6" mains, 1,500 gpm at 55 psi, two 4" and seven 2-1/2" outlets north side, one 4" and five 2-1/2" outlets south side.		
Salt water	12" mains, 4,000 gpm at 150 psi, fourteen 4" and six 2-1/2" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 10,000 cfm at 100 psi, thirty-two 2" outlets each side.		
Steam	6" mains, 20,000 phr at 100 psi, twenty 2" outlets each side.		
CHT sewer	8" and 10" mains, twenty 4" inlets each side.		

FIGURE 33 (Continued)
Norfolk Naval Shipyard Drydock No. 4

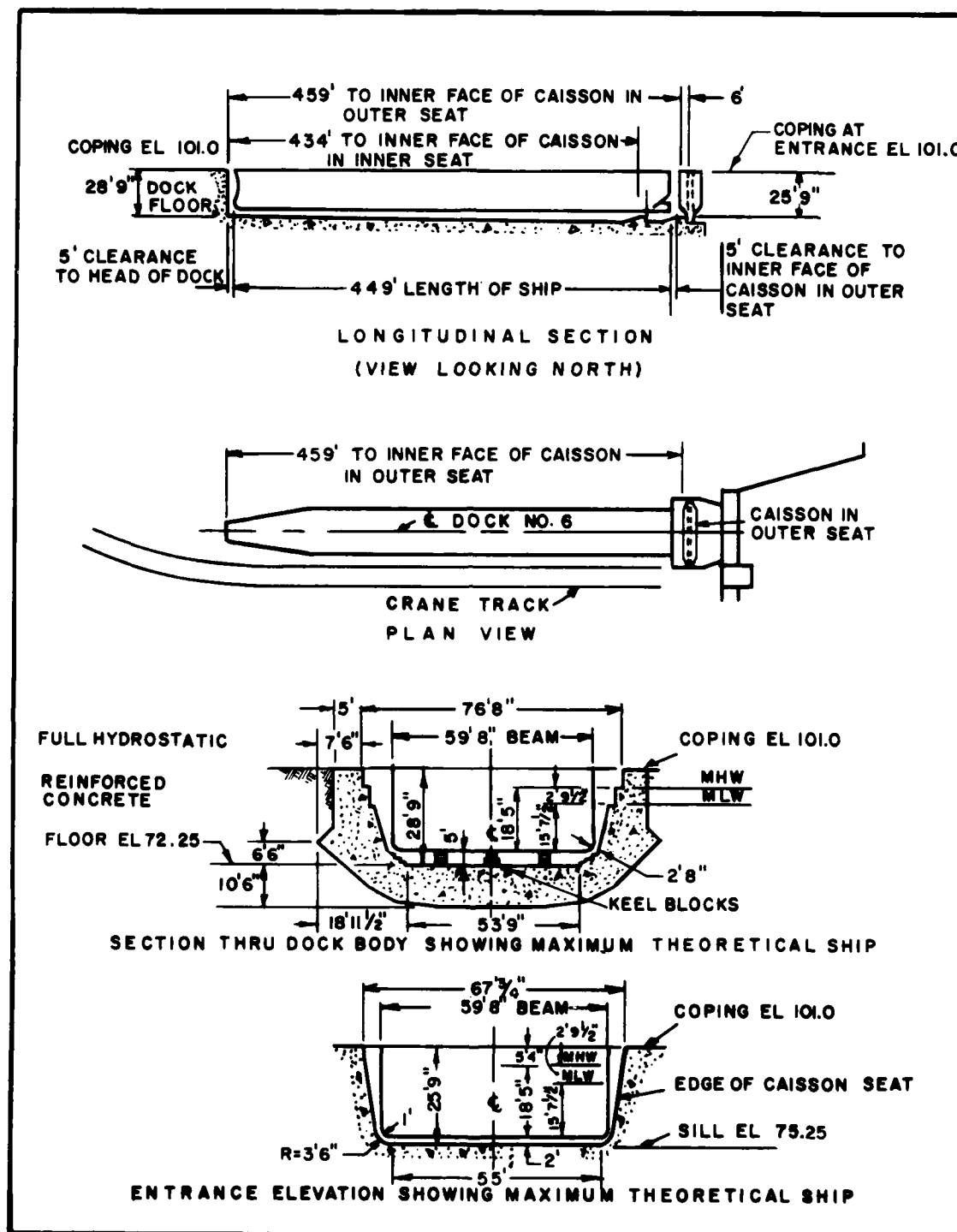
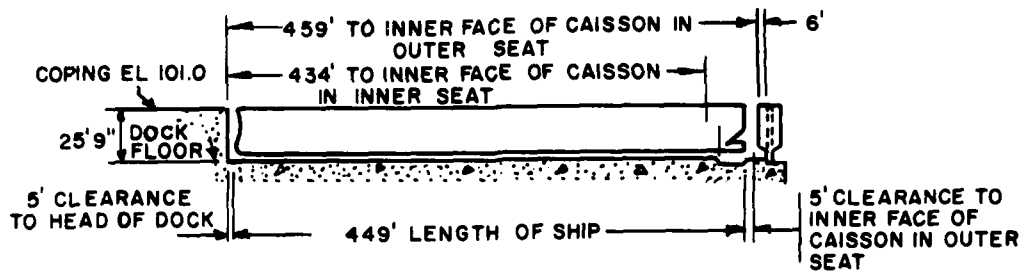


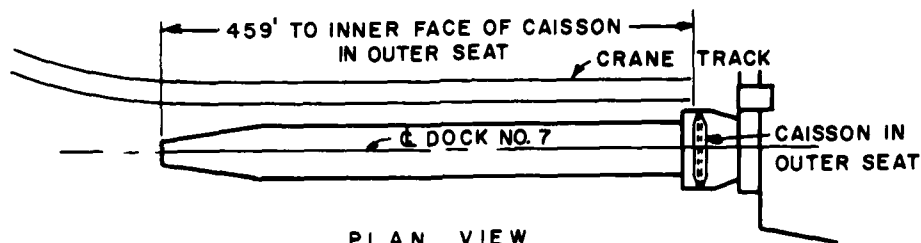
FIGURE 34
 Norfolk Naval Shipyard Drydock No. 6

Date Completed	Suitable for Docking	Foundation	Construction Material
1919	Service craft	Earth	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Three 54", 1,250 hp, 330,000 gpm (Drydock No. 4 pumphouse). Time to dewater: 15 min.		
Drainage pumps	Two 12", 150 hp, 10,000 gpm (Drydock No. 4 pumphouse).		
Flooding	Through caisson. Time to flood: 30 min.		
Capstans	Uses south side Drydock No. 3 and north side Drydock No. 7 capstans.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	60 lg tons	109'10"	
Whip	5 lg tons	152'0", 64'0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	800	2 north side and 3 south side at 400 amps.
Item	Data		
Fresh water	6" main, 600 gpm at 55 psi, four 2-1/2" outlets south side.		
Salt water	12" mains, 4,000 gpm at 150 psi, four 4" and one 2-1/2" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	6" main, 2,400 cfm at 100 psi, sixteen 1-1/4" outlets south side. 4" headers at dock floor with outlets.		
Steam	6" main, 8,000 phr at 100 psi, ten 2" outlets south side.		

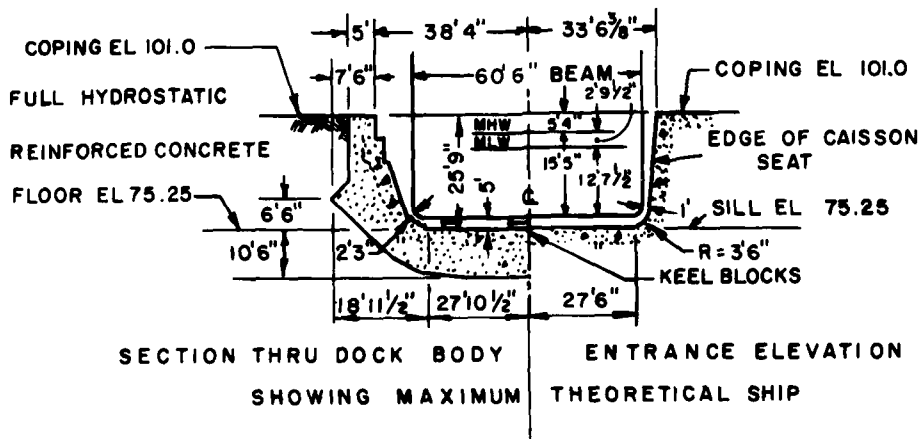
FIGURE 34 (Continued)
Norfolk Naval Shipyard Drydock No. 6



LONGITUDINAL SECTION
(VIEW LOOKING NORTH)



PLAN VIEW



SECTION THRU DOCK BODY
SHOWING MAXIMUM

ENTRANCE ELEVATION
THEORETICAL SHIP

FIGURE 35
Norfolk Naval Shipyard Drydock No. 7

Date Completed	Suitable for Docking	Foundation	Construction Material
1919	Service craft	Earth	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Three 54", 1,250 hp, 330,000 gpm (Drydock No. 4 pumphouse). Time to dewater: 15 min.		
Drainage pumps	Two 12", 150 hp, 10,000 gpm (Drydock No. 4 pumphouse).		
Flooding	Through caisson. Time to flood: 30 min.		
Capstans	Total 2: 1 at head, 30 fpm at 30k; 1 north side of entrance, 7 fpm at 29k. Also uses north side Drydock No. 4 capstans.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	60 lg tons	109'10"	
Whip	5 lg tons	152'0", 64'0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz	460	800	3 each side at 400 amps.
Item	Data		
Fresh water	6" main, 600 gpm at 55 psi, four 2-1/2" outlets north side.		
Salt water	12" mains, 4,000 gpm at 150 psi, four 4" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	6" main, 2,400 cfm at 100 psi, sixteen 1-1/4" outlets north side. 4" headers at dock floor with outlets.		
Steam	6" main, 8,000 phr at 100 psi, ten 2" outlets north side.		

FIGURE 35 (Continued)
Norfolk Naval Shipyard Drydock No. 7

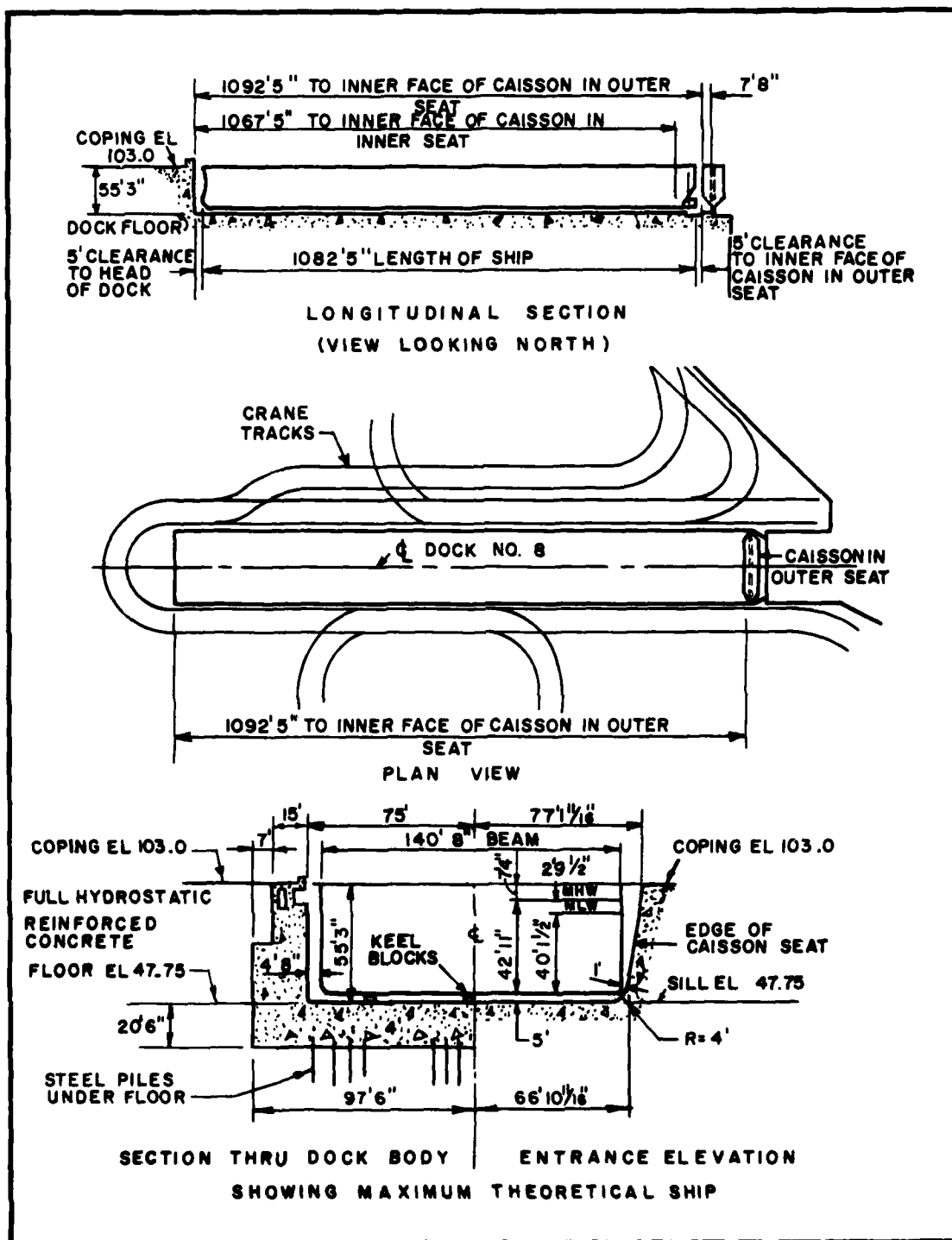


FIGURE 36
 Norfolk Naval Shipyard Drydock No. 8

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	CVN	Piles	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Four 54", 1,200 hp, 520,000 gpm. Time to dewater: 140 min.		
Drainage pumps	Two 16", 250 hp, 19,000 gpm.		
Flooding	Through culverts. Time to flood: 105 min.		
Capstans	14 total: 1 each side of head and of entrance, 30 fpm at 24k; 5 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	75 lg tons	93'5"	
Auxiliary ..	25 lg tons	120'0"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	11,500	600	2 south side at 500 amps.
Ac, 3 Ph, 60 Hz ..	460	6,000	16 north side and 35 south side at 400 amps.
Item	Data		
Fresh water	6" mains, 1,500 gpm at 55 psi, twenty 2-1/2" outlets each side.		
Salt water	12" mains, 8,000 gpm at 150 psi, eight 4" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	8" mains, 10,000 cfm at 100 psi, eighty-five 1-1/4" to 2" outlets each side.		
Steam	8" mains, 40,000 phr at 100 psi, twenty-five 2" outlets each side.		
Oxygen	1" and 1-1/2" mains, 700 cfm at 90 psi, twenty 3/4" outlets each side.		
CHT sewer	6", 8" and 10" mains, twenty-six 4" inlets each side.		

FIGURE 36 (Continued)
Norfolk Naval Shipyard Drydock No. 8

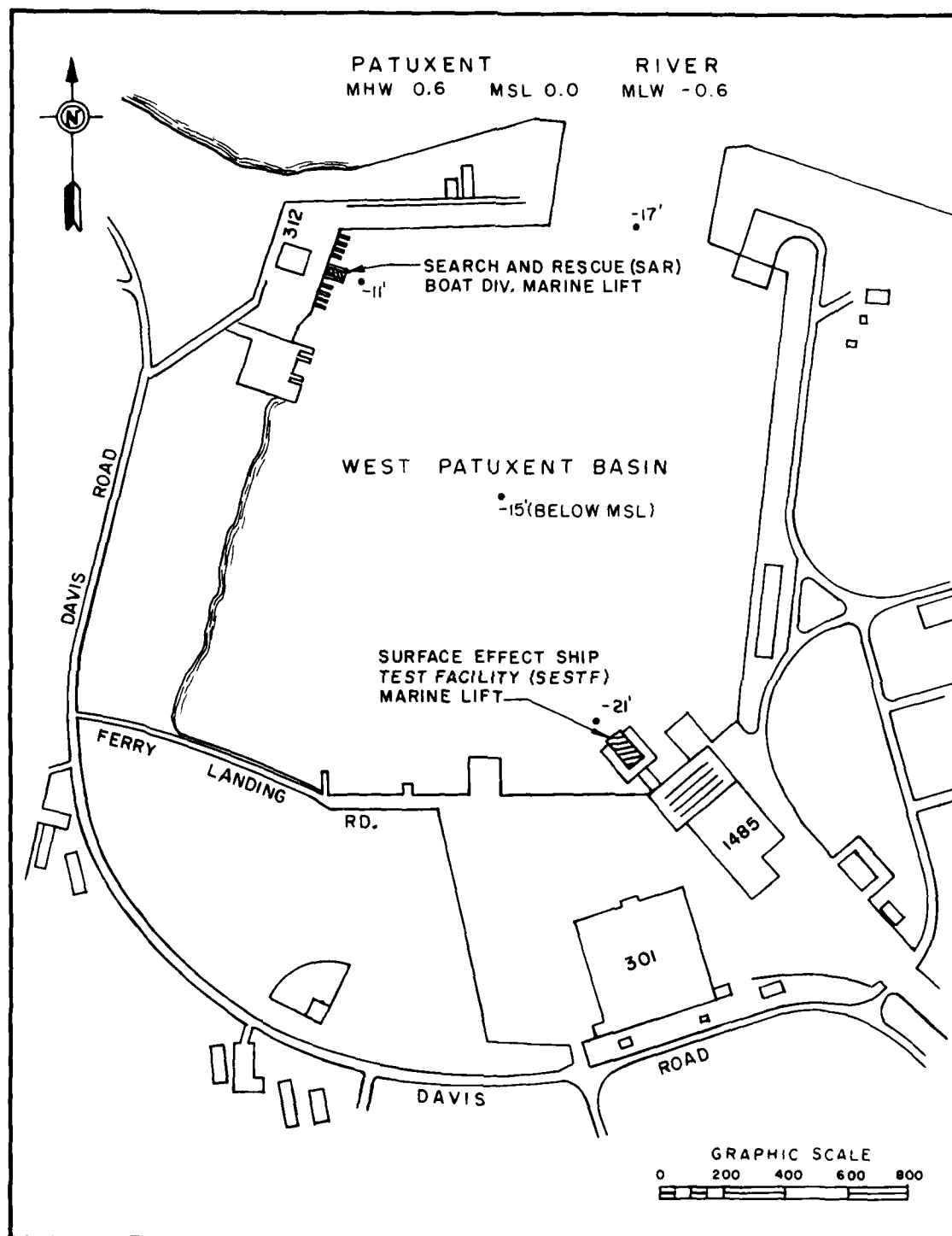


FIGURE 37
Location of Marine Lifts, Naval Air Station, Patuxent River, Maryland

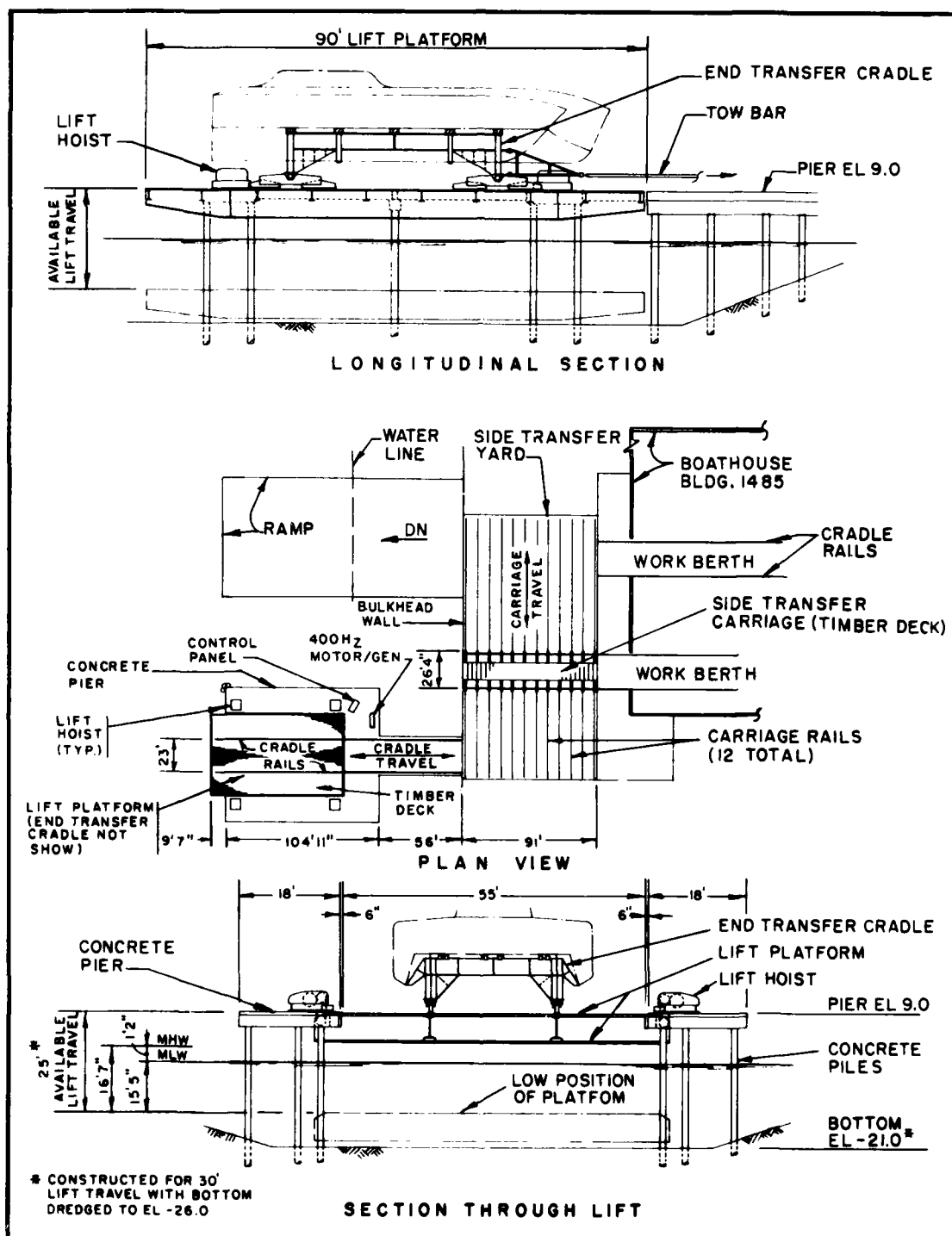


FIGURE 38
Patuxent River Naval Air Station SESTF Marine Lift

Date constructed	1972
Capacity	250 lg tons.
For docking	SES.
Type of lift	4 unit syncrolift with transfer systems.
Piers	Foundation- Concrete piles. Construction materials- Precast prestressed concrete deck panels and reinforced concrete beams.
Boat winch	One motor operated unit on south pier.
Hoists	Foundation- Concrete piles and reinforced concrete pile caps. Four 90 lg ton hoists at 60'0" spacing. Motors- Four 7.5 hp. Lifting speed- 1 fpm. Cable- 6 part, 1" diameter.
Platform	Construction materials- Steel framing with timber deck. Cradle rails- Two 85 lb rails at 23'0" centers. Maximum lifting time- 25 minutes.
Cradle	Construction material- Steel framing. Number available- Two. Rocker assemblies- Four per cradle, four 10" diameter wheels per assembly. End transfer- By tow bar and tractor.
Side transfer system	Foundation- Reinforced concrete. Rails- Twelve 85 lb rails at 3'0" centers. Carriage- Steel framing with central wood decking. 26'4" W x 90'6" L with seventy-two 10" diameter wheels. Side transfer- By tow bar and tractor.
Boat house	Two work berths, each having rail length of approximately 145 ft.
Electrical service ..	Ac, 3 ph, 60 hz, 460 v, 400 amps; One 200 and three 60 amp receptacles on east side; One 60 amp receptacle on west side. Ac, 3 ph, 400 hz, 115/200 v, 216 amps; Two 200 amp receptacles on south side.
Fresh water	1-1/2" main, 470 gpm at 50 psi, two 1-1/2" and two 3/4" outlets on west side.
Fire protection	Shore hydrant, 1,000 gpm at 125 psi.
Fuel	2" and 3" mains, two 2-1/2" outlets each side.
Cranes	Bridge crane over west work berth of boat house, 2 tons. Mobil crane in side transfer area, 10 tons.

FIGURE 38 (Continued)
Patuxent River Naval Air Station SESTF Marine Lift

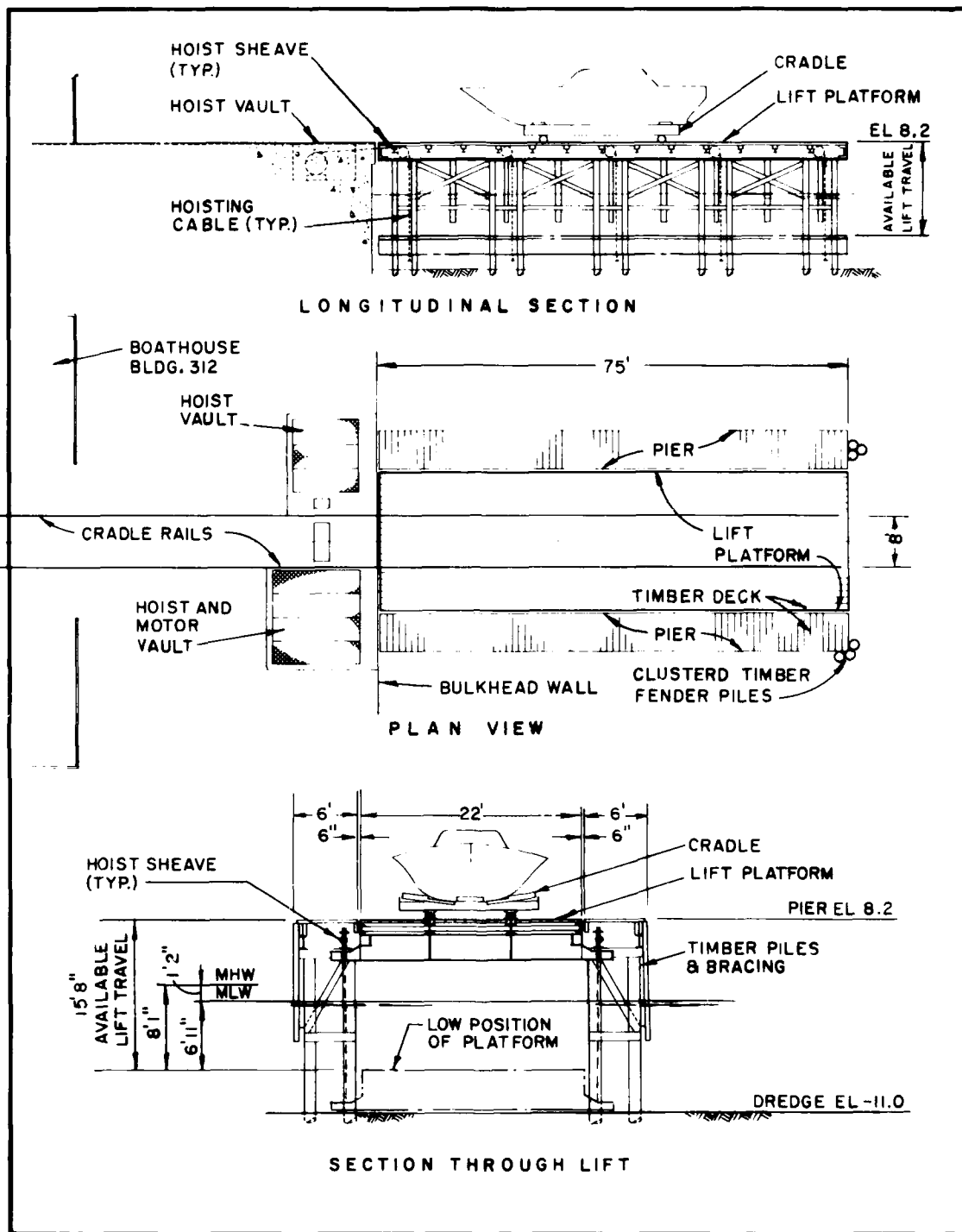


FIGURE 39
Patuxent River Naval Air Station SAR Marine Lift

Date constructed	1942 (Lift platform reconstructed in 1972).
Capacity	60 lg tons.
For docking	Station craft.
Type of lift	2 Hoist multi-cable lift with end transfer system.
Piers	Foundation- Timber piles.
	Construction materials- Wood and steel beams with timber deck.
	Ten 24" diameter hoisting cable sheaves (5 each pier).
Hoists	Foundation- Reinforced concrete onshore vaults.
	Two 30 lg ton hoists interconnected by a common drive shaft.
	Motor- One 55 hp.
	Lifting Speed- 1 fpm.
	Cable- Five 1" diameter cables each hoist.
Platform	Construction materials- Steel framing with timber deck.
	Cradle rails- Two 40 lb rails at 8'0" centers.
	Maximum lifting time- 15 minutes.
Cradle	Construction material- Steel framing.
	Number available- Two.
	Number of wheels- Six 10" diameter.
	End transfer- Manual.
Boat house	One work berth having rail length of approximately 100 ft.
Cranes	One 2-1/2 ton monorail in boat house.

FIGURE 39 (Continued)
Patuxent River Naval Air Station SAR Marine Lift

Drydock Portal Cranes		
Crane No.	Drydock No.	Capacity (lg tons)
P-52	1,2,3,4, & MR2	50,10
P-58,60, 61,62, 65,& 68-73	do	25,5
P-59,63	do	30,5
P-64	do	15,5
P-66,67	do	50,15,5

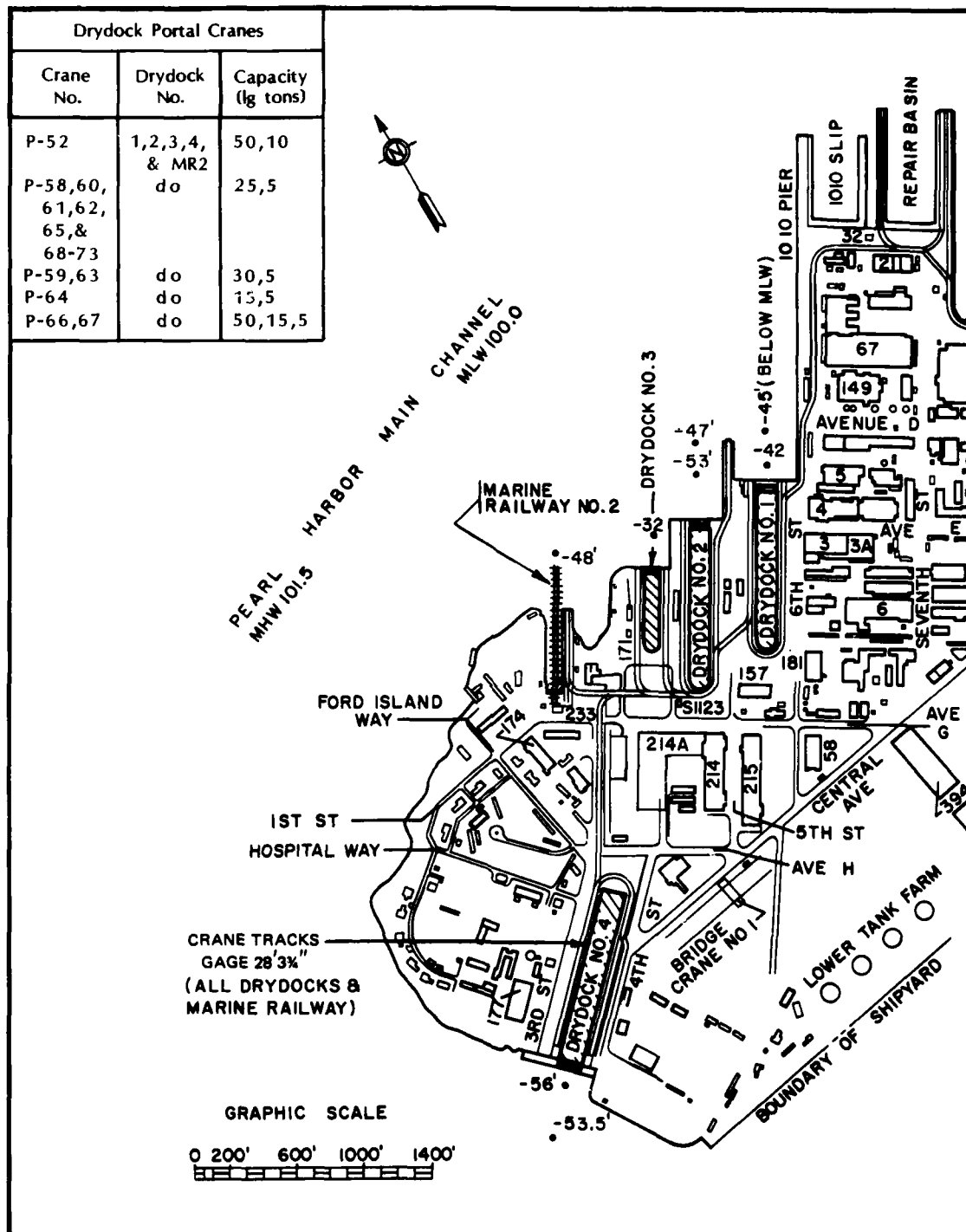


FIGURE 40
Location of Drydocks and Marine Railway,
Pearl Harbor Naval Shipyard, Oahu, Hawaii

Date Completed	Suitable for Docking	Foundation	Construction Material
1919	CVA	Piles	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Four 48", 550 hp, 264,000 gpm. Also connected to Drydock No. 2 pumphouse. Time to dewater: 140 min.		
Drainage pumps	Two 15", 85 hp, 13,750 gpm.		
Flooding	Through caisson and culverts. Time to flood: 60 min. Superflooding pumps: two 30", 100 hp, 48,000 gpm.		
Capstans	10 total: 1 at head, 1 each side of entrance, 30 fpm at 24k; 4 east side, 3 west side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	86'9"	
Auxiliary ..	15 lg tons	135'6"	
Whip	5 lg tons	146'1", 83'9" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	7,200	1 east side at 4,800 amps; 1 west side at 1,200 amps; 4 east side and 1 west side at 400 amps.
Fresh water	8" west and 12" east side mains, 1,500 gpm at 65 psi, six 2-1/2" outlets east side, four 2-1/2" outlets west side.		
Salt water	8" west and 12" east side mains, 2,700 gpm at 80 psi, ten 2-1/2" outlets east side, eight 2-1/2" outlets west side. 4" header at dock floor with outlets.		
Fire protection ...	Same as salt water.		
Compressed air	4" west and 6" east side mains, 10,000 cfm at 90 psi, six 1-1/4" to 2-1/2" outlets east side, ten 1-1/4" to 2-1/2" outlets west side.		
Steam	4" main, 10,000 phr at 85 psi, seventeen 1-1/2" to 2-1/2" outlets west side.		
Sanitary sewer	6" mains, 1,000 gpm, twenty-two 6" inlets each side.		

FIGURE 41 (Continued)
Pearl Harbor Naval Shipyard Drydock No. 1

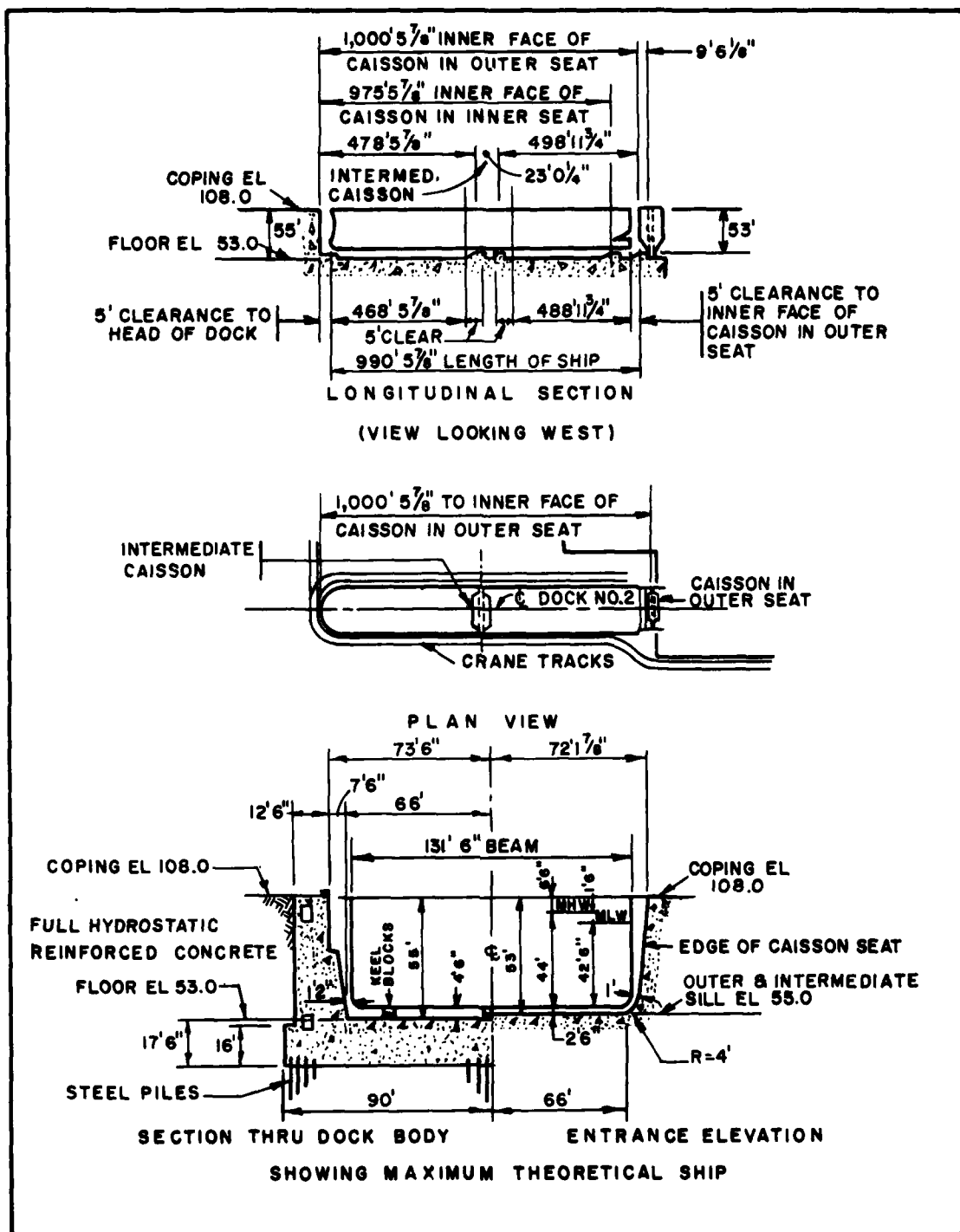


FIGURE 42
Pearl Harbor Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1941	CVA	Piles	Concrete
Closure	Caisson, steel (rectangular box type). Also identical intermediate caisson available as spare.		
Dewatering pumps ..	Four 54", 1,250 hp, 520,000 gpm. Also connected to Drydock No. 1 pumphouse. Time to dewater: 90 min, north section; 140 min, total dock.		
Drainage pumps	Two 16", 250 hp, 14,400 gpm; two 16", 200 hp, 12,000 gpm.		
Flooding	Through culverts. Time to flood: 75 min, north section; 90 min, total dock.		
Capstans	13 total: 1 at head, 1 each side of entrance, 30 fpm at 24k; 5 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	82'1"	
Auxiliary ..	15 lg tons	128'10"	
Whip	5 lg tons	138'10", 83'9" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	10,800	2 east side at 4,800 amps; 3 east side at 1,600 amps; 3 east side and 6 west side at 600 amps.
Fresh water	6" mains, 2,800 gpm at 65 psi, twelve 2-1/2" outlets each side.		
Salt water	8" mains, 5,400 gpm at 80 psi, seven 2-1/2" outlets east side, eleven 2-1/2" outlets west side.		
Fire protection ...	Same as salt water.		
Sea water cooling .	16" main, 8,000 gpm at 25 psi, four 12" outlets east side.		
Compressed air	6" mains, 19,200 cfm at 90 psi, six 2-1/2" and twelve 1-1/4" outlets each side.		
Steam	6" mains, 15,000 phr at 85 psi, two 2-1/2" outlets east side, three 2-1/2" outlets west side, six 1-1/2" outlets each side.		
Sanitary sewer	8" mains, 550 gpm, twenty-three 6" inlets each side.		

FIGURE 42 (Continued)
Pearl Harbor Naval Shipyard Drydock No. 2

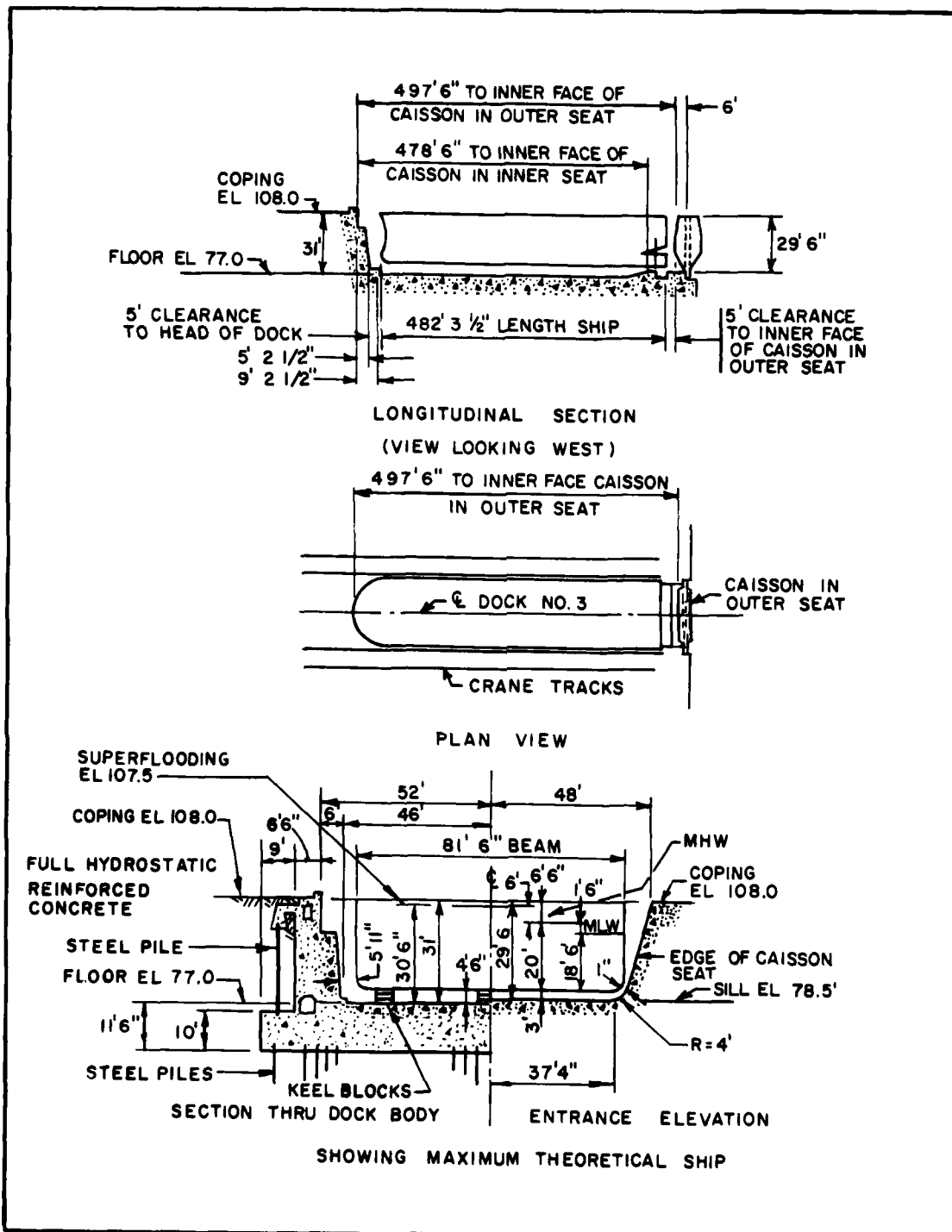


FIGURE 43
Pearl Harbor Naval Shipyard Drydock No. 3

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	DD, SSBN	Piles	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Dewatered by Drydock No. 1 or 2 pumps. Time to dewater: 40 min.		
Drainage pumps	One 10", 75 hp, 3,000 gpm. Drydock No. 2 pumps also used.		
Flooding	Through culverts. Time to flood: 45 min. Super-flooding pumps: three 12", 100 hp, 9,000 gpm.		
Capstans	5 total: 1 at head, 30 fpm at 24k; 1 each side of entrance, 1 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	97'4"	
Auxiliary ..	15 lg tons	143'0"	
Whip	5 lg tons	149'0", 83'9" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	6,000	1 west side at 4,800 amps; 3 each side at 400 amps.
Item	Data		
Fresh water	6" mains, 1,050 gpm at 65 psi, three 2-1/2" outlets each side, two 1-1/2" outlets east side.		
Salt water	6" mains, 900 gpm at 80 psi, three 2-1/2" outlets each side. 2-1/2" headers at dock floor with outlets.		
Fire protection ...	Same as salt water.		
Compressed air	4" mains, 9,600 cfm at 90 psi, seven 2-1/2" outlets east side, three 2-1/2" outlets west side, six 1-1/4" outlets each side.		
Steam	4" mains, 15,000 phr at 85 psi, six 1-1/2" outlets each side.		
Sanitary sewer	8" mains, 200 gpm, twenty-two 6" inlets each side.		

FIGURE 43 (Continued)
Pearl Harbor Naval Shipyard Drydock No. 3

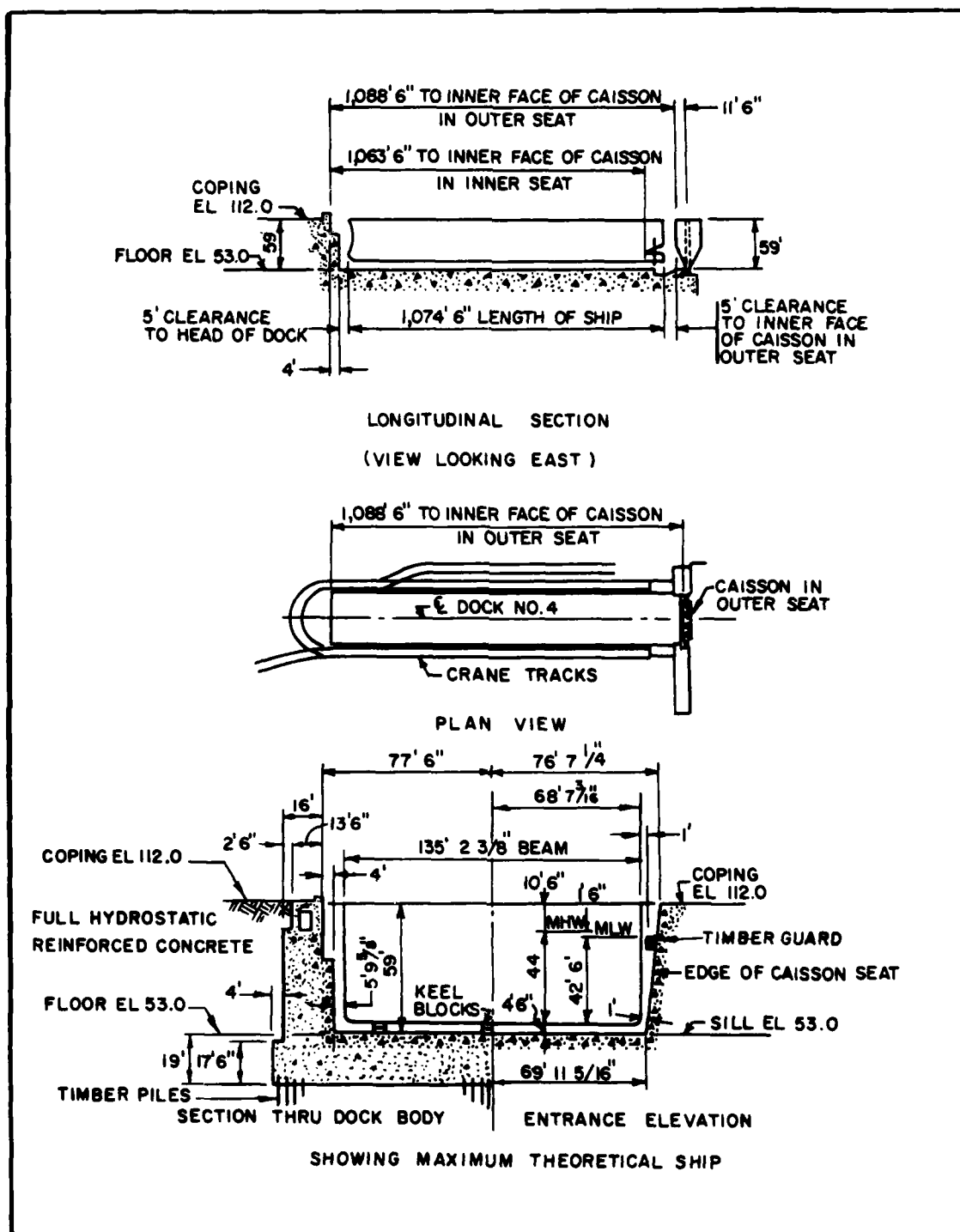
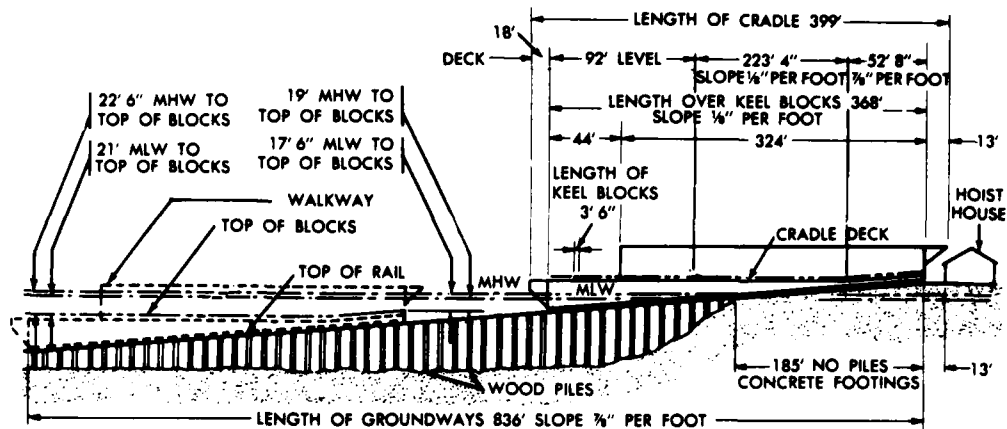


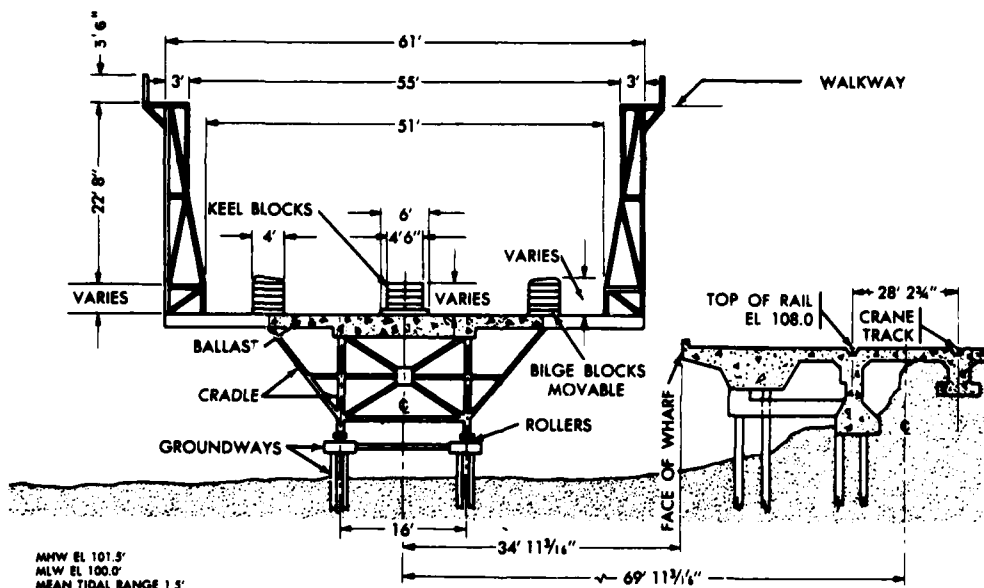
FIGURE 44
Pearl Harbor Naval Shipyard Drydock No. 4

Date Completed	Suitable for Docking	Foundation	Construction Material
1943	CVN	Piles	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Four 63", 1,250 hp, 668,000 gpm. Time to dewater: 190 min.		
Drainage pumps	Two 12", 150 hp, 10,000 gpm.		
Flooding	Through culverts. Time to flood: 120 min.		
Capstans	13 total: 1 at head, 1 each side of entrance, 30 fpm at 24k; 5 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	79'1"	
Auxiliary ..	15 lg tons	124'6"	
Whip	5 lg tons	134'2", 83'9" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	9,400	1 west side at 4,800 amps; 3 west side at 1,600 amps; 1 west side at 600 amps; 6 east and 2 west side at 400 amps.
Item	Data		
Fresh water	6" mains, 2,100 gpm at 65 psi, twelve 2-1/2" outlets each side.		
Salt water	8" mains, 3,600 gpm at 80 psi, twelve 2-1/2" outlets east side, eleven 2-1/2" outlets west side. 8" headers at dock floor with outlets.		
Fire protection ...	Same as salt water		
Compressed air	6" mains, 20,000 cfm at 90 psi, two 2-1/2" and fifteen 1-1/4" outlets east side, eighteen 1-1/4" outlets west side. 4" headers at dock floor with outlets.		
Steam	6" mains, 10,000 phr at 75 psi, twelve 1-1/2" outlets each side.		
Sanitary sewer	8" mains, 450 gpm, twenty-eight 6" inlets each side.		

FIGURE 44 (Continued)
Pearl Harbor Naval Shipyard Drydock No. 4



ELEVATION
(LOOKING SOUTHEAST)



TYPICAL SECTION
(LOOKING OFFSHORE)

FIGURE 45
Pearl Harbor Naval Shipyard Marine Railway No. 2

Capacity	2,500 lg tons.
For Docking	SS, DD, and Fleet tugs.
Wharf	On one side.
Groundway	Foundation- Wood piles and concrete. Construction materials- Offshore, piles and concrete. Inshore, concrete. Width of track- 16'0". Number of rails- Two. Slope of track- 7/8" per ft.
Cradle	Slope of deck- Level, 1/8" and 7/8" per ft. Slope at top of keel blocks- 1/8" per ft. Material- Cradle framing, steel. Superstructure framing, steel. Bridge at bow- Yes. Speed- Uphaul, 10 fpm; downhaul, 10 fpm. Rollers- 4" diameter; number- 1,252.
Hauling mechanism ...	Motor-Electric induction, 500 hp, 2,200 v, 3 ph, 60 hz, 360 kw. Chains- Uphaul, 4 chains, 2-3/4" diameter. Down- haul, 4 chains, 1-3/4" diameter.
Electrical service ..	Ac, 3 ph, 60 hz, 460 v, 1,200 amps; One 300 and two 400 amp receptacles on east side.
Fresh water	6" main, 900 gpm at 65 psi, five 2-1/2" outlets east side.
Salt water	8" main, 1,200 gpm at 80 psi, five 2-1/2" outlets east side.
Fire protection	Same as salt water.
Compressed air	4" main, 3,000 cfm at 90 psi, five 2-1/2" outlets east side.
Steam	6" main, 80 psi, five 2" outlets east side.
Cranes	Portal cranes, 50 t at 70 ft. rad. (hook 98'10" above track), 15 t at 70 ft. rad. (hook 143'0" above track), 5 t at 83'9" rad. (hook 149'0" above track).

FIGURE 45 (Continued)
Pearl Harbor Naval Shipyard Marine Railway No. 2

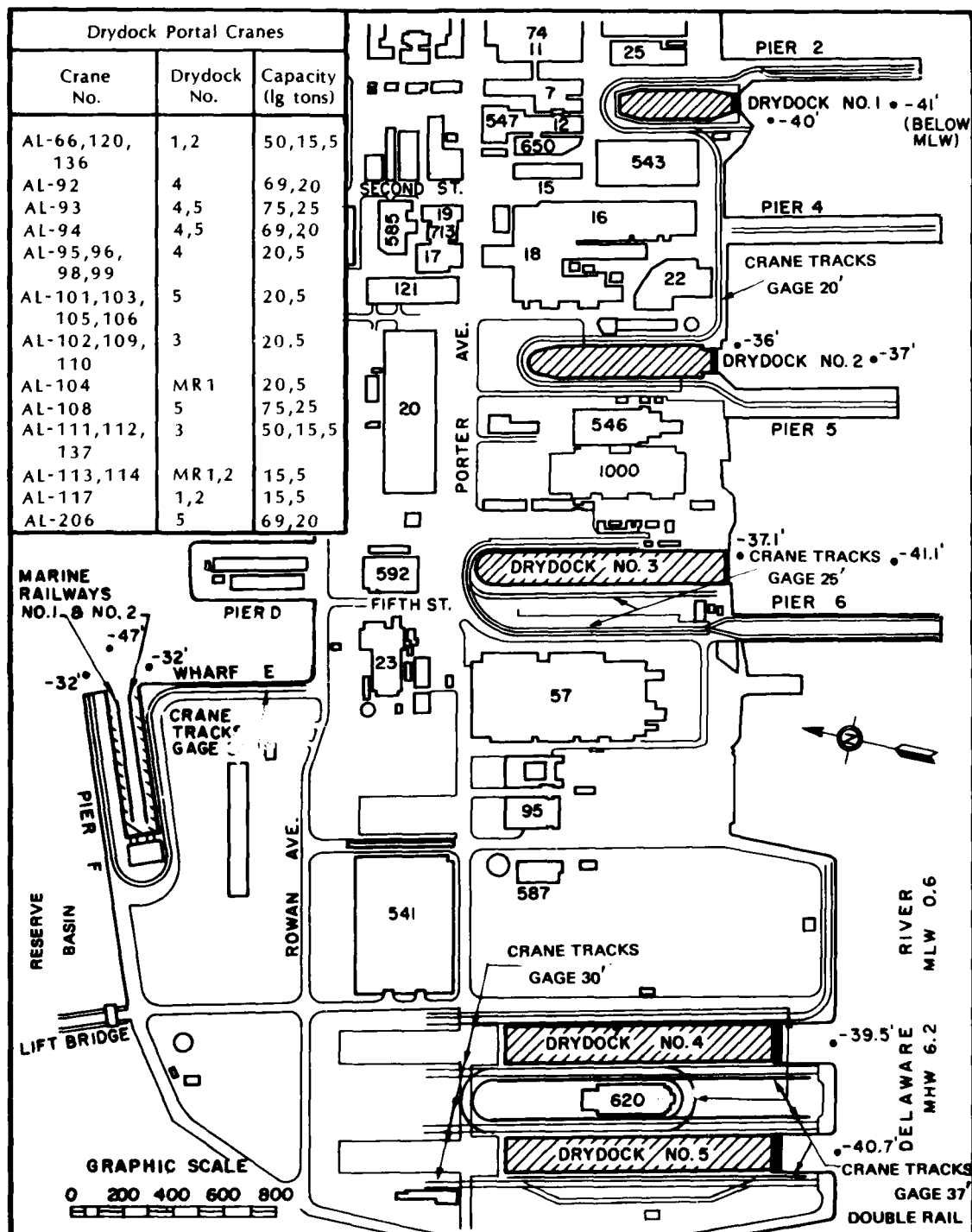
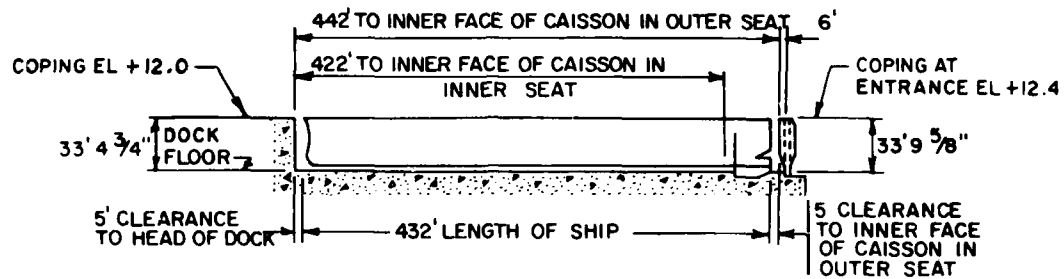
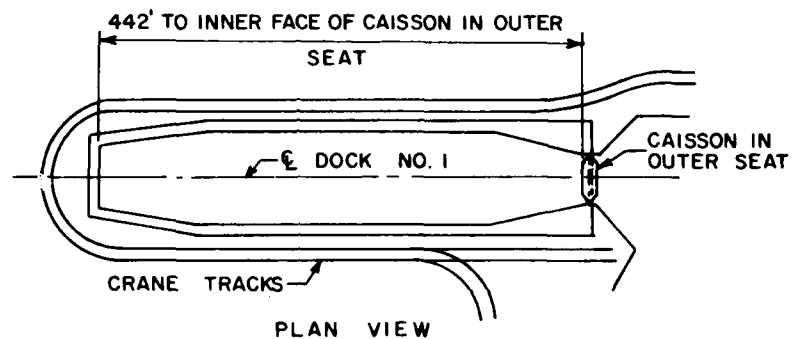


FIGURE 46
Location of Drydocks and Marine Railways, Philadelphia Naval Shipyard,
Philadelphia, Pennsylvania



LONGITUDINAL SECTION
(VIEW LOOKING EAST)



PLAN VIEW

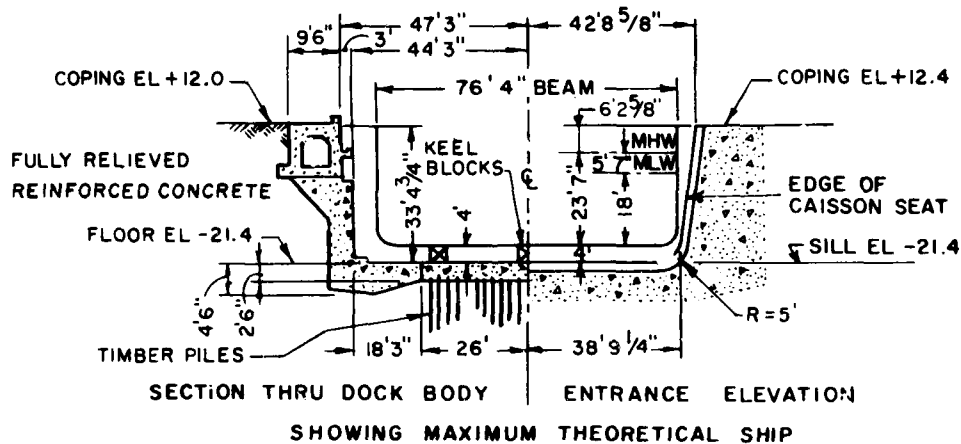


FIGURE 47

Philadelphia Naval Shipyard Project

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DRYDOCKING FACILITIES CHARACTERISTICS. DESIGN MANUAL 29.3. (U)
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Date Completed	Suitable for Docking	Foundation	Construction Material
1956	DD, SS	Piles	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Two 36", 500 hp, 68,000 gpm. Time to dewater: 90 min.		
Drainage pumps	Two 16", 125 hp, 15,000 gpm.		
Flooding	Through culverts. Time to flood: 60 min.		
Capstans	4 total: 1 at head, 12 fpm at 35k; 1 each side of entrance, 30 fpm at 12k; 1 west side, 10 fpm at 20k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	125'9"	
Auxiliary ..	15 lg tons	161'0"	
Whip	5 lg tons	175'0", 85'0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	2,800	4 each side at 400 amps.
Item	Data		
Fresh water	6" and 8" mains, 800 gpm at 45 psi, four 2-1/2" outlets east side, five 2-1/2" outlets west side.		
River water	8" mains, 2,800 gpm at 125 psi, four 4" outlets each side.		
Fire protection ...	Same as river water. Two 1,400 gpm at 102 psi river water booster pumps.		
Compressed air	6" mains, 5,000 cfm at 100 psi, thirty 1-1/4" outlets.		
Steam	6" mains, 40,000 phr at 100 psi, seven 2" and nine 1-1/2" outlets.		
Oxygen	3" mains, 800 cfm at 100 psi, 3/4" outlets.		
Sanitary sewer	8" mains, 500 gpm, twenty-one 4" inlets each side.		
MAPP gas	2" mains, 5 psi, seven 3/4" outlets east side, five 3/4" outlets west side.		

FIGURE 47 (Continued)
Philadelphia Naval Shipyard Drydock No. 1

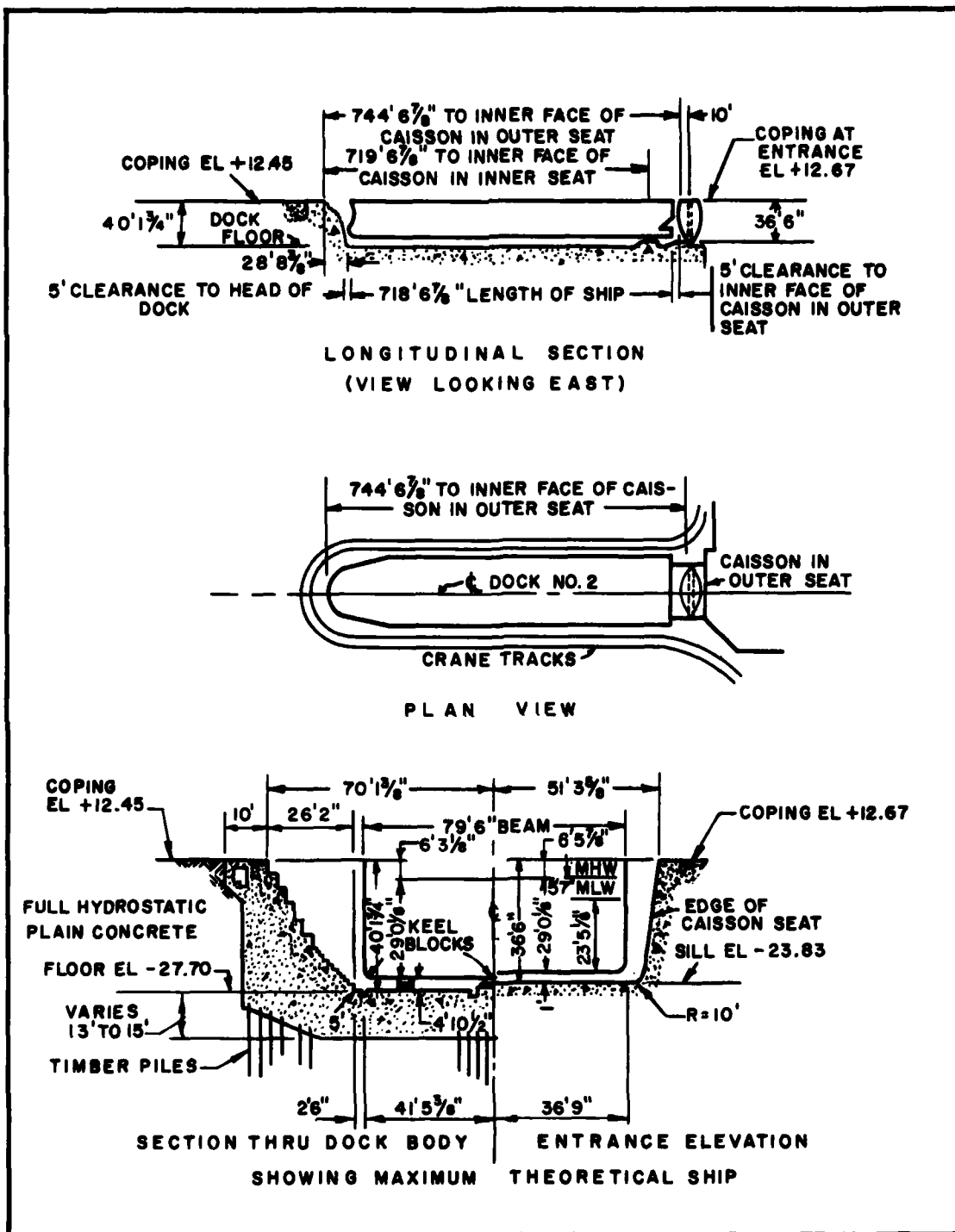
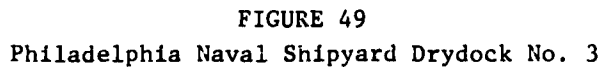


FIGURE 48
Philadelphia Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1908	CA	Piles	Concrete
Item	Data		
Closure	Caisson, steel (ship type).		
Dewatering pumps ..	Three 45", 400 hp, 186,000 gpm. Time to dewater: 120 min.		
Drainage pumps	One 20", 125 hp, 7,000 gpm; one 10", 60 hp, 3,500 gpm.		
Flooding	Through caisson. Time to flood: 90 min.		
Capstans	9 total: 1 at head, 1 at west side of entrance, 25 fpm at 20k; 1 east side of entrance, 3 each side, 25 fpm at 9k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	118'2"	
Auxiliary ..	15 lg tons	161'0"	
Whip	5 lg tons	173'8", 85'0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	10,400	4,000 amp bus each side; 3 east side and 4 west side at 400 amps.
Fresh water	6" mains, 800 gpm at 45 psi, eight 2-1/2" and two 1-1/2" outlets east side, four 2-1/2" and three 1-1/2" outlets west side.		
River water	10" mains, 4,200 gpm at 140 psi, fourteen 4" outlets each side, one 2-1/2" outlet east side.		
Fire protection ...	Same as river water. Two 2,100 gpm at 108 psi river water booster pumps.		
Compressed air	4" mains, 3,600 cfm at 100 psi, thirty-four 1-1/4" and six 1" outlets. 3" headers at dock floor with outlets.		
Steam	6" and 8" mains, 80,000 phr at 100 psi, seventeen 2" and two 1-1/4" outlets.		
Oxygen	2-1/2" mains, 450 cfm at 100 psi, seventeen 3/4" outlets.		
Sanitary sewer	6" mains, 400 gpm, fifteen 4" inlets each side.		
MAPP gas	2-1/2" mains, 5 psi, eight 3/4" outlets east side, seven 3/4" outlets west side.		

FIGURE 48 (Continued)
Philadelphia Naval Shipyard Drydock No. 2



Date Completed	Suitable for Docking	Foundation	Construction Material
1921	CVS, CG	Earth	Concrete
Item	Data		
Closure	Caisson, steel (hydrometer type).		
Dewatering pumps ..	Three 54", 1,250 hp, 315,000 gpm. Time to dewater: 180 min.		
Drainage pumps	Two 15", 150 hp, 30,000 gpm.		
Flooding	Through culvert. Flooding time: 60 min.		
Capstans	7 total: 1 at head, 1 each side of entrance, 2 each side, 30 fpm at 30k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	108'2"	
Auxiliary ..	15 lg tons	137'6"	
Whip	5 lg tons	220'0", 104'0" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	13,550	Two 4,000 amp bus west side; 23 east side and 4 west side at 400 amps.
Item	Data		
Fresh water	4" and 8" mains, 1,000 gpm at 45 psi, twelve 2-1/2" outlets east side, eight 2-1/2" and four 1-1/2" outlets west side.		
River water	12" mains, 7,000 gpm at 150 psi, eighteen 4" outlets each side.		
Fire protection ...	Same as river water. Three 2,500 gpm at 119 psi river water booster pumps.		
Compressed air	6" mains, 10,000 cfm at 100 psi, nineteen 1-1/4" outlets. 2-1/2" headers at dock floor with outlets.		
Steam	5", 6" and 8" main, 40,000 phr at 100 psi, seventeen 2" and one 1" outlets east side.		
Oxygen	2-1/2" mains, 900 cfm at 120 psi, thirty-six 3/4" outlets.		
Sanitary sewer	4" and 6" mains, 600 gpm, twenty 4" inlets each side.		
MAPP gas	2" mains, 5 psi, sixteen 3/4" outlets east side, thirteen 3/4" outlets west side.		

FIGURE 49 (Continued)
Philadelphia Naval Shipyard Drydock No. 3

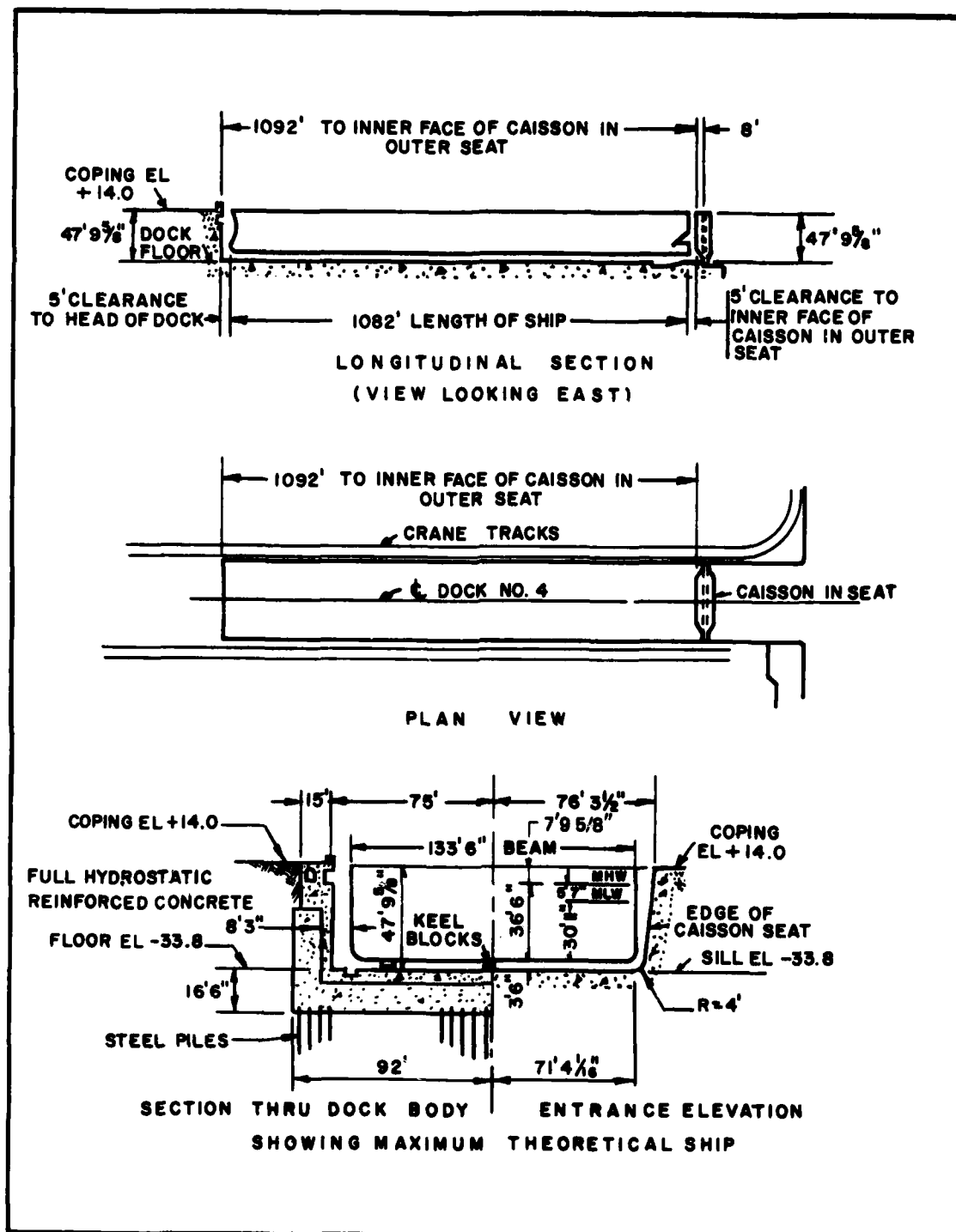


FIGURE 50
Philadelphia Naval Shipyard Drydock No. 4

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	CV	Piles	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Three 54", 1,200 hp, 390,000 gpm. Pumps also used for Drydock No. 5.		
	Time to dewater: 180 min.		
Drainage pumps	Two 16", 250 hp, 20,000 gpm. Pumps also used for Drydock No. 5.		
Flooding	Through culverts. Time to flood: 90 min.		
Capstans	9 total: 1 at head, 1 each side of entrance, 1 each side, 30 fpm at 24k; 2 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	75 lg tons	90'0"	
Auxiliary ..	25 lg tons	118'4"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	14,250	Two 4,000 amp bus west side; 17 east side and 22 west side at 400 amps.
Item	Data		
Fresh water	6" mains, 800 gpm at 45 psi, twenty-four 2-1/2" outlets each side.		
River water	12" mains, 7,000 gpm at 175 psi, eighteen 4" high pressure and twenty-four 2-1/2" low pressure (100 psi) outlets each side.		
Fire protection ...	Same as river water.		
Compressed air	6" mains, 10,000 cfm at 100 psi, one hundred forty-four 1-1/4" outlets.		
Steam	6" mains, 80,000 phr at 100 psi, forty-four 2" outlets.		
Oxygen	2" and 3" mains, 800 cfm at 100 psi, thirty-six 3/4" outlets.		
Sanitary sewer	8" mains, 3,200 gpm, twenty-nine 4" inlets each side.		
MAPP gas	2" mains, 5 psi, twenty-two 3/4" outlets east side, nineteen 3/4" outlets west side.		

FIGURE 50 (Continued)
Philadelphia Naval Shipyard Drydock No. 4

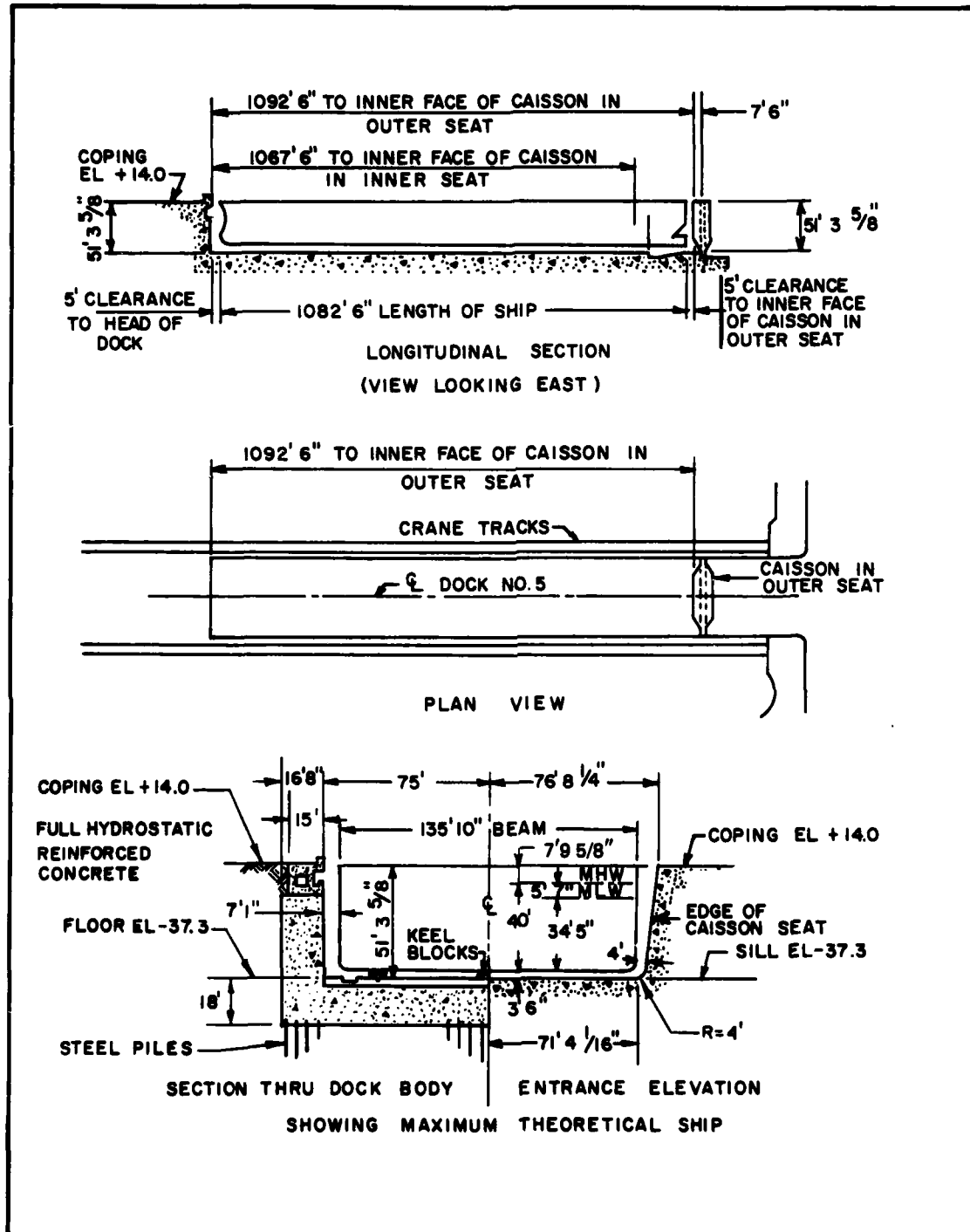


FIGURE 51
Philadelphia Naval Shipyard Drydock No. 5

Date Completed	Suitable for Docking	Foundation	Construction Material
1943	CV	Piles	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Three 54", 1,200 hp, 390,000 gpm. Pumps also used for Drydock No. 4.		
	Time to dewater: 210 min.		
Drainage pumps	Two 16", 250 hp, 20,000 gpm. Pumps also used for Drydock No. 4.		
Flooding	Through culverts. Time to flood: 120 min.		
Capstans	9 total: 1 at head, 1 each side of entrance, 1 each side, 30 fpm at 24k; 2 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	75 lg tons	90'0"	
Auxiliary ..	25 lg tons	118'4"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	14,250	Two 4,000 amp bus east side; 22 east side and 17 west side at 400 amps.
Item	Data		
Fresh water	6" mains, 800 gpm at 45 psi, none 2-1/2" and six 1-1/2" outlets east side, ten 2-1/2" and seven 1-1/2" outlets west side.		
River water	12" mains, 7,000 gpm at 175 psi, eighteen 4" high pressure and twenty-one 2-1/2" low pressure (100 psi) outlets each side.		
Fire protection ...	Same as river water.		
Compressed air	6" mains, 10,000 cfm at 100 psi, one hundred 1-1/4" outlets. 4" headers at dock floor with outlets.		
Steam	6" mains, 80,000 phr at 100 psi, twenty-five 2-1/2" and twenty-four 2" outlets.		
Oxygen	2" mains, 460 cfm at 100 psi, thirty-six 3/4" outlets.		
Sanitary sewer	8" mains, 3,200 gpm, twenty-nine 4" inlets each side.		
MAPP gas	2" mains, 5 psi, twenty-two 3/4" outlets each side.		

FIGURE 51 (Continued)
Philadelphia Naval Shipyard Drydock No. 5

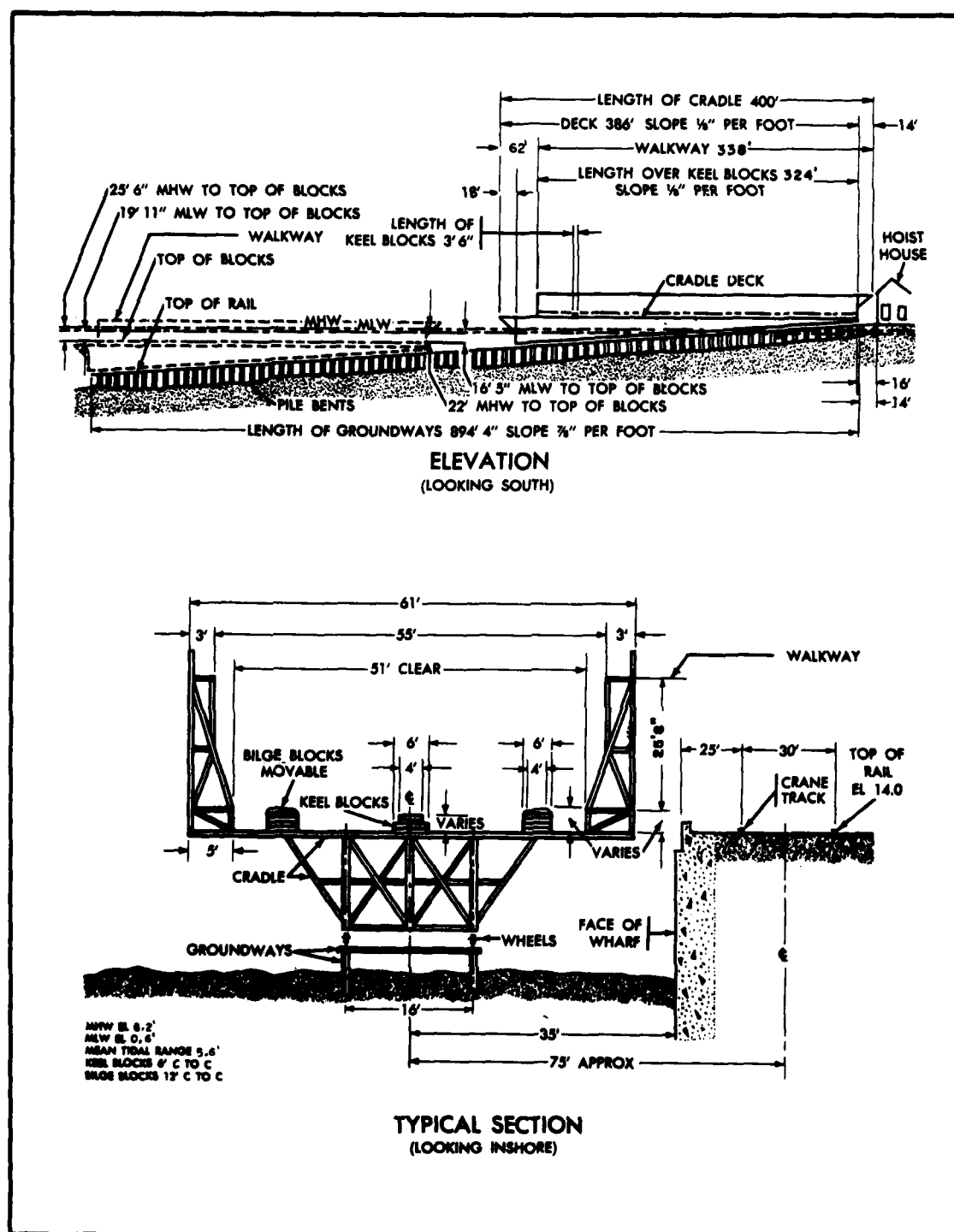


FIGURE 52
Philadelphia Naval Shipyard Marine Railway No. 1

Capacity	2,500 lg tons.
For docking	SS, DD, FF, and Fleet tugs.
Wharf	On one side.
Groundway	Foundation- Piles and concrete. Construction materials- Offshore, piles and concrete. Inshore, concrete. Width of track- 16'0". Number of rails- Two. Slope of track- 7/8" per ft.
Cradle	Slope at deck- 1/8" per ft. Slope at top of keel blocks- 1/8" per ft. Material- Cradle framing, steel. Superstructure framing, steel. Bridge at bow- Yes. Electric boat winch at bow- 15 hp. Speed- Uphaul, 20 fpm; downhaul, 20 fpm. Wheels- 18" diameter.
Hauling mechanism ...	Motor-Electric induction, 400 hp, 2,300 v, 3 ph, 60 hz, 50 to 300 kw. Chains- Uphaul, 4 chains, 2-1/4" diameter. Do 4 chains, 1-1/8" diameter.
Electrical service ..	Ac, 3 ph, 60 hz, 460 v, 1,200 amps; Three 400 amp receptacles on north side.
Fresh water	6" main, 500 gpm at 45 psi, one 3" outlet north side.
River water	8" main, 1,200 gpm at 55 psi, two 3" outlets north side.
Fire protection	Same as river water, 90 psi, four 2-1/2" and eight 1-1/2" outlets north side.
Compressed air	6" main, 5,000 cfm at 100 psi, thirteen 2-1/2" outlets north side.
Steam	6" main, 40,000 phr at 100 psi, one 2" outlet north side.
Oxygen	1-1/2" main, 150 cfm at 100 psi, five 3/4" outlets north side.
MAPP gas	2" main, 5 psi, seven 3/4" outlets north side.
Cranes	1 Portal crane, 20 t at 115 ft. rad. (hook 123'0" above track), 5 t at 120 ft. rad. (hook 130'0" above track).

FIGURE 52 (Continued)
Philadelphia Naval Shipyard Marine Railway No. 1

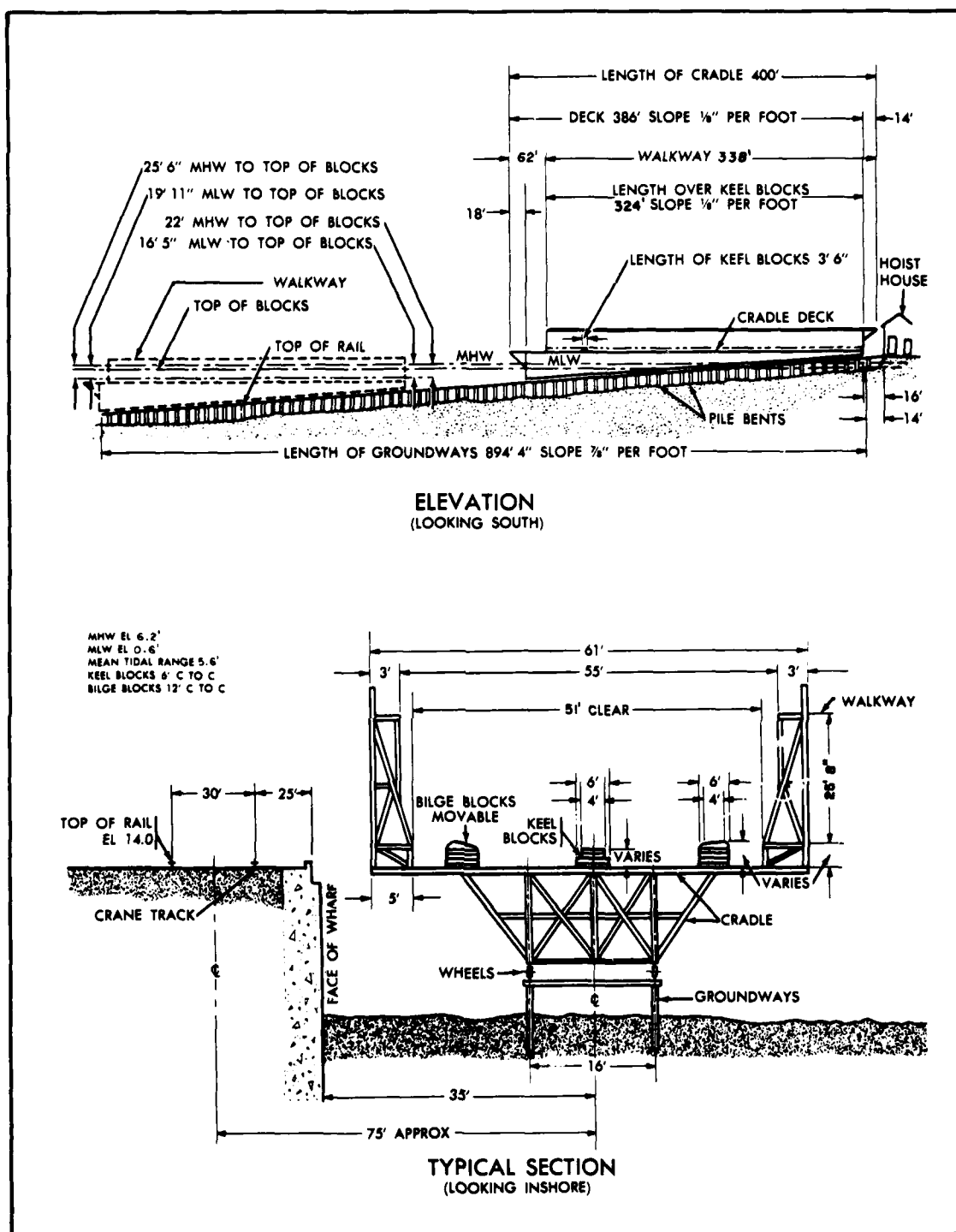


FIGURE 53
 Philadelphia Naval Shipyard Marine Railway No. 2

Capacity	2,500 lg tons.
For docking	SS, DD, FF, and Fleet tugs.
Wharf	On one side.
Groundway	Foundation- Piles and concrete.
	Construction materials- Offshore, piles and concrete.
	Inshore, concrete.
	Width of track- 16'0".
	Number of rails- Two.
	Slope of track- 7/8" per ft.
Cradle	Slope of deck- 1/8" per ft.
	Slope at top of keel blocks- 1/8" per ft.
	Material- Cradle framing, steel. Superstructure framing, steel.
	Bridge at bow- Yes.
	Electric boat winch at bow- 15 hp.
	Speed- Uphaul, 20 fpm; downhaul, 20 fpm.
	Wheels- 18" diameter.
Hauling mechanism ...	Motor-Electric induction, 400 hp, 2,300 v, 3 ph, 60 hz, 50 to 300 kw.
	Chains- Uphaul, 4 chains, 2-1/4" diameter. Downhaul, 4 chains, 1-1/8" diameter.
Electrical service ..	Ac, 3 ph, 60 hz, 460 v, 1,200 amps; Three 400 amp receptacles on south side.
Fresh water	6" main, 500 gpm at 45 psi, one 3" outlet south side.
River water	8" main, 1,200 gpm at 55 psi, two 3" outlets south side.
Fire protection	Same as river water, 90 psi, six 2-1/2" outlets south side.
Compressed air	6" main, 5,000 cfm at 100 psi, thirteen 2-1/2" outlets south side.
Steam	6" main, 40,000 phr at 100 psi, nine 3/4" outlets south side.
Oxygen	2-1/2" main, 450 cfm at 100 psi, nine 3/4" outlets south side.
MAPP gas	2" main, 5 psi, nine 3/4" outlets south side.
Cranes	2 Portal cranes, 15 t at 85 ft. rad. (hook 44'0" above track), 5 t at 105 ft. rad. (hook 52'0" above track).

FIGURE 53 (Continued)
Philadelphia Naval Shipyard Marine Railway No. 2

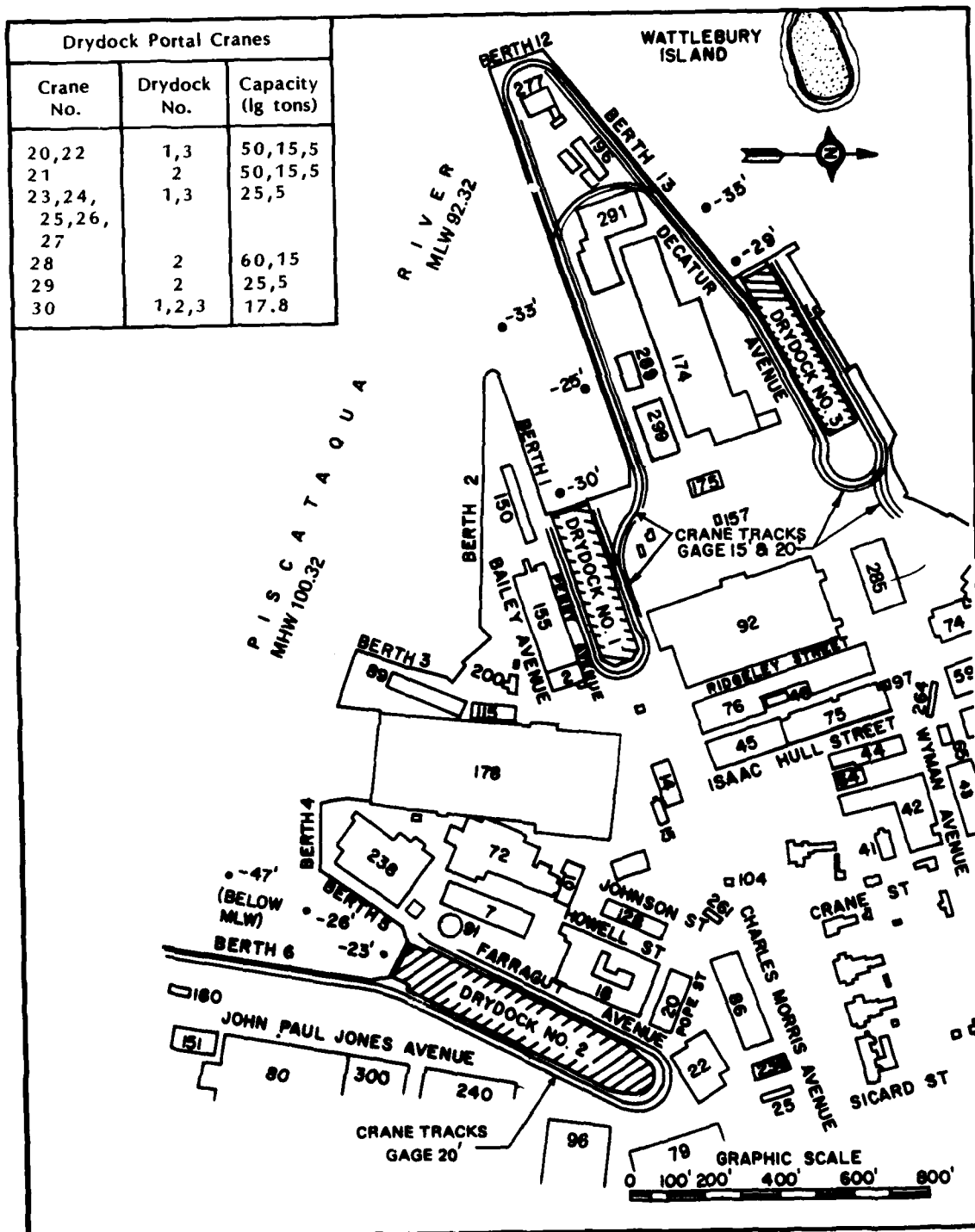


FIGURE 54
Location of Drydocks, Portsmouth Naval Shipyard, Portsmouth, New Hampshire

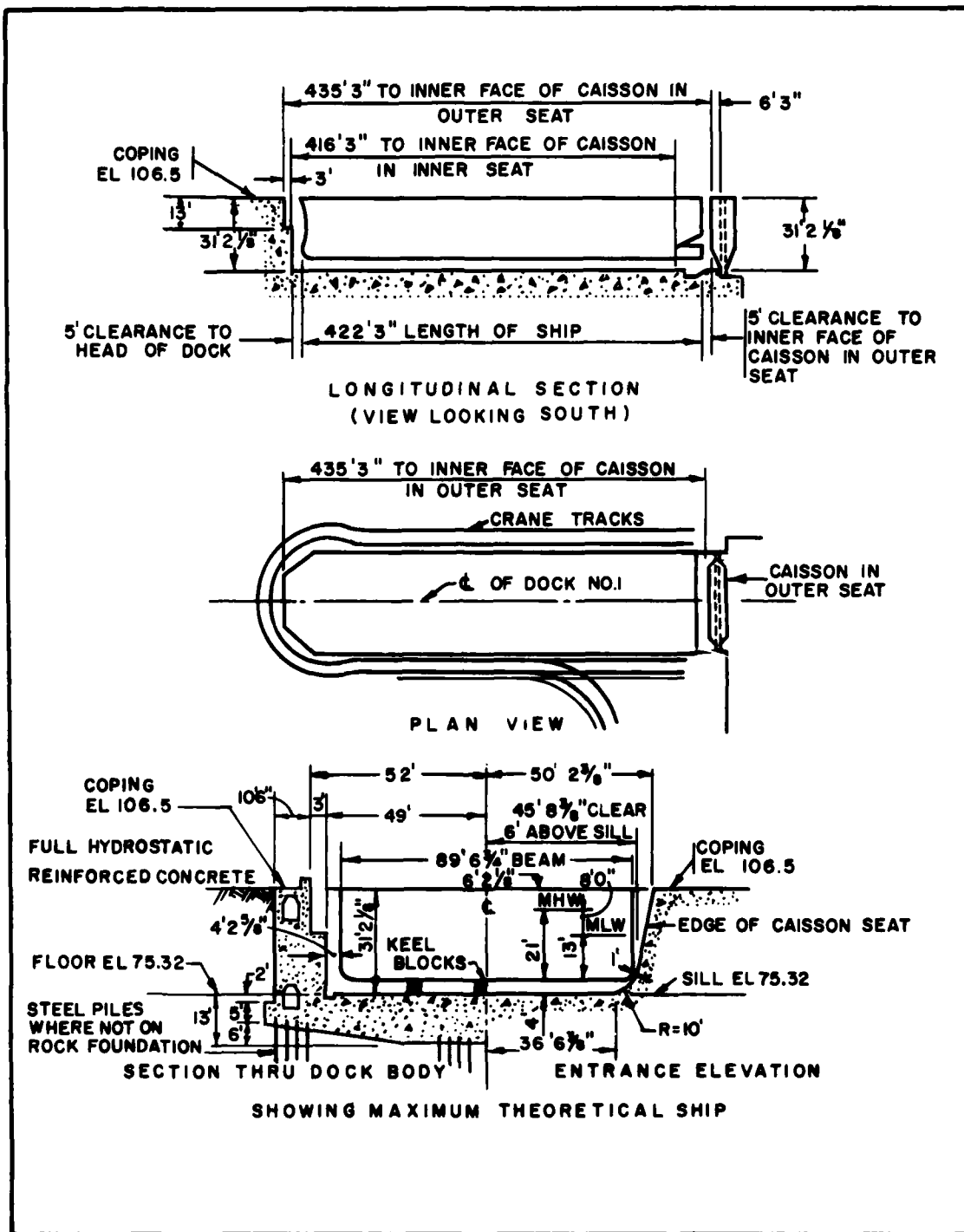


FIGURE 55
Portsmouth Naval Shipyard Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	SSN	Rock or piles	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Two 48", 350 hp, 146,000 gpm. Time to dewater: 75 min.		
Drainage pumps	Two 16", 150 hp, 14,000 gpm.		
Flooding	Through culverts. Time to flood: 75 min.		
Capstans	6 total: 1 at head, 30 fpm at 24k; 1 each side of entrance, 1 each side, 1 at east end of Berth 11, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	118'8"	
Auxiliary ..	15 lg tons	145'10"	
Whip	5 lg tons	144'7", 65'6" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	1,400	3 north side and 5 south side at 400 amps
Ac, 3 Ph, 60 Hz ..	460	1,200	3 south side at 400 amps.
Dc	375	3,500	2 north side and 4 south side at 1,000 amps.
Fresh water	4" mains, 400 gpm at 65 psi, three 2" outlets each side. 4" headers at dock floor with outlets.		
Salt water	6" mains, 1,000 gpm at 100 psi, two 2-1/2" outlets each side. 4" headers at dock floor with outlets.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 100 psi, three 2" outlets each side. 4" headers at dock floor with outlets.		
Low pressure	3" south and 4" north side mains, 4,250 phr at 100 psi, three 4" outlets north side, three 1-1/2" outlets south side. 4" headers at dock floor with outlets.		
steam			
High pres. steam ..	8" main, 600 psi, one 6" outlet north side.		
Oxygen	1-1/2" mains, 110 psi, three 3/4" outlets each side.		
Sanitary sewer	4" south side main, 200 gpm, one 4" inlet.		
MAPP gas	1-1/2" mains, 15 psi, three 3/4" outlets each side.		

FIGURE 55 (Continued)
Portsmouth Naval Shipyard Drydock No. 1

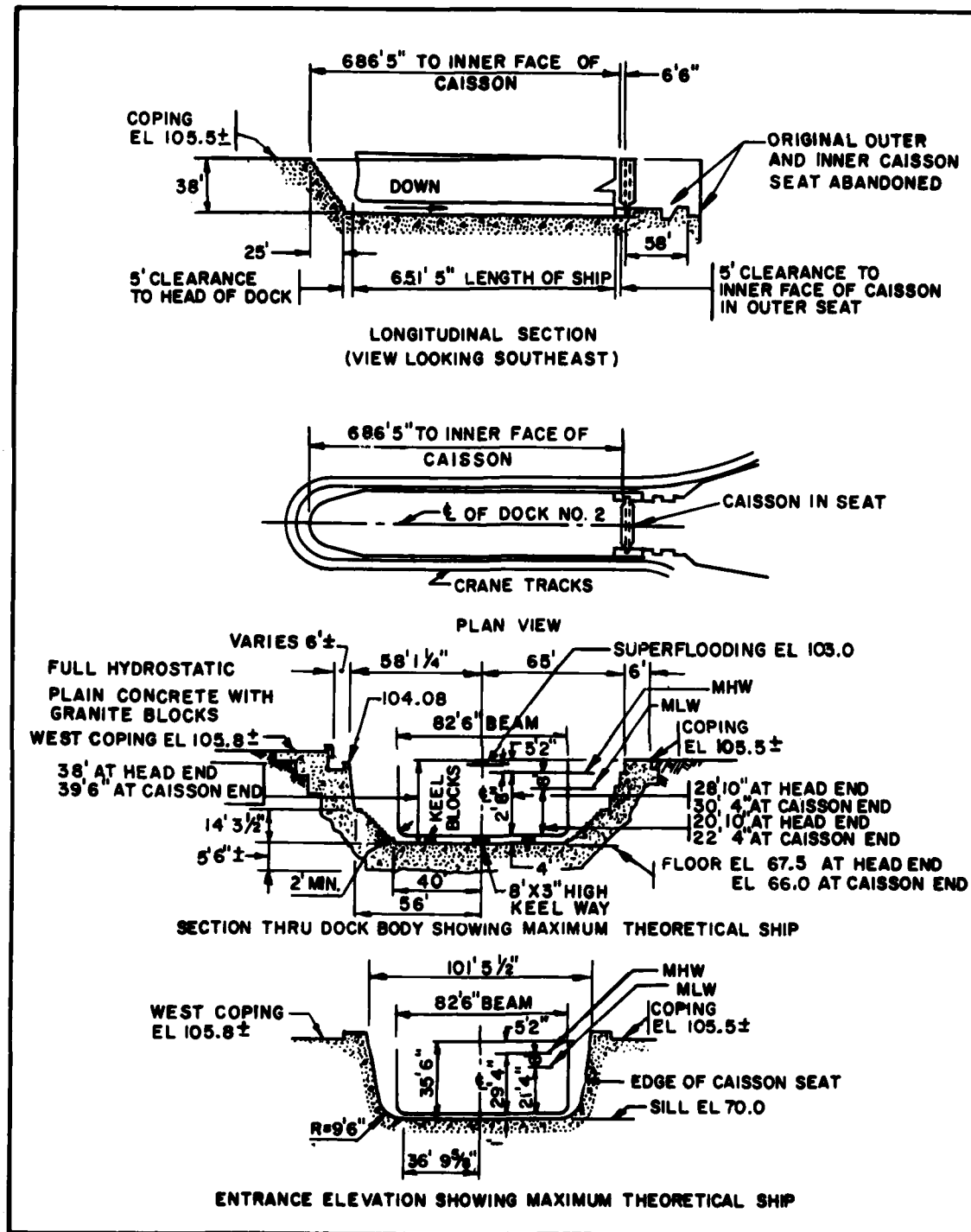


FIGURE 56
Portsmouth Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1905	SSBN	Rock	Concrete and granite
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Three 45", 600 hp, 210,000 gpm. Time to dewater: 150 min.		
Drainage pumps	Two 14", 75 hp, 10,000 gpm.		
Flooding	Through caisson. Time to flood: 75 min. Superflooding pumps: two 30", 125 hp, 20,000 gpm.		
Capetaus	8 total: 4 each side, 30 fpm at 24k. 3 winches: 1 at head, 1 each side of entrance, 15 fpm at 20k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	44.6 lg tons	109'10"	
Auxiliary ..	15 lg tons	136'6"	
Whip	5 lg tons	137'3", 65'6" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	3,200	2 west side at 1,600 amps.
Ac, 3 Ph, 60 Hz ..	460	3,200	4 each side at 400 amps.
Ac, 3 Ph, 60 Hz ..	460	2,400	6 west side at 400 amps.
Dc	375	2,040	4 west side at 1,020 amps.
Fresh water	12" west and 16" east side mains, 65 psi, eight 2-1/2" outlets east side, twelve 2-1/2" outlets west side. 2" and 4" headers at dock floor with outlets.		
Fire protection ...	Same as fresh water.		
Low pressure air ..	6" mains, 100 psi, three 3" and one 2" outlets east side, four 3" outlets west side. 2" and 4" headers at dock floor with outlets.		
High pressure air .	Two 1" west side mains, 4,500 psi, six 1" outlets.		
Low pressure	4" mains, 7,400 phr at 100 psi, one 4" outlet east side, four 3" outlets west side. 2" and 4" headers at dock floor with outlets.		
steam			
High pres. steam ..	6" main, 600 psi, three 6" outlets west side.		
Oxygen	2" mains, 110 psi, four 1" outlets each side.		
Sanitary sewer	4" east side main, 200 gpm, five 4" inlets.		
MAPP gas	2" mains, 15 psi, four 1" outlets each side.		

FIGURE 56 (Continued)
Portsmouth Naval Shipyard Drydock No. 2

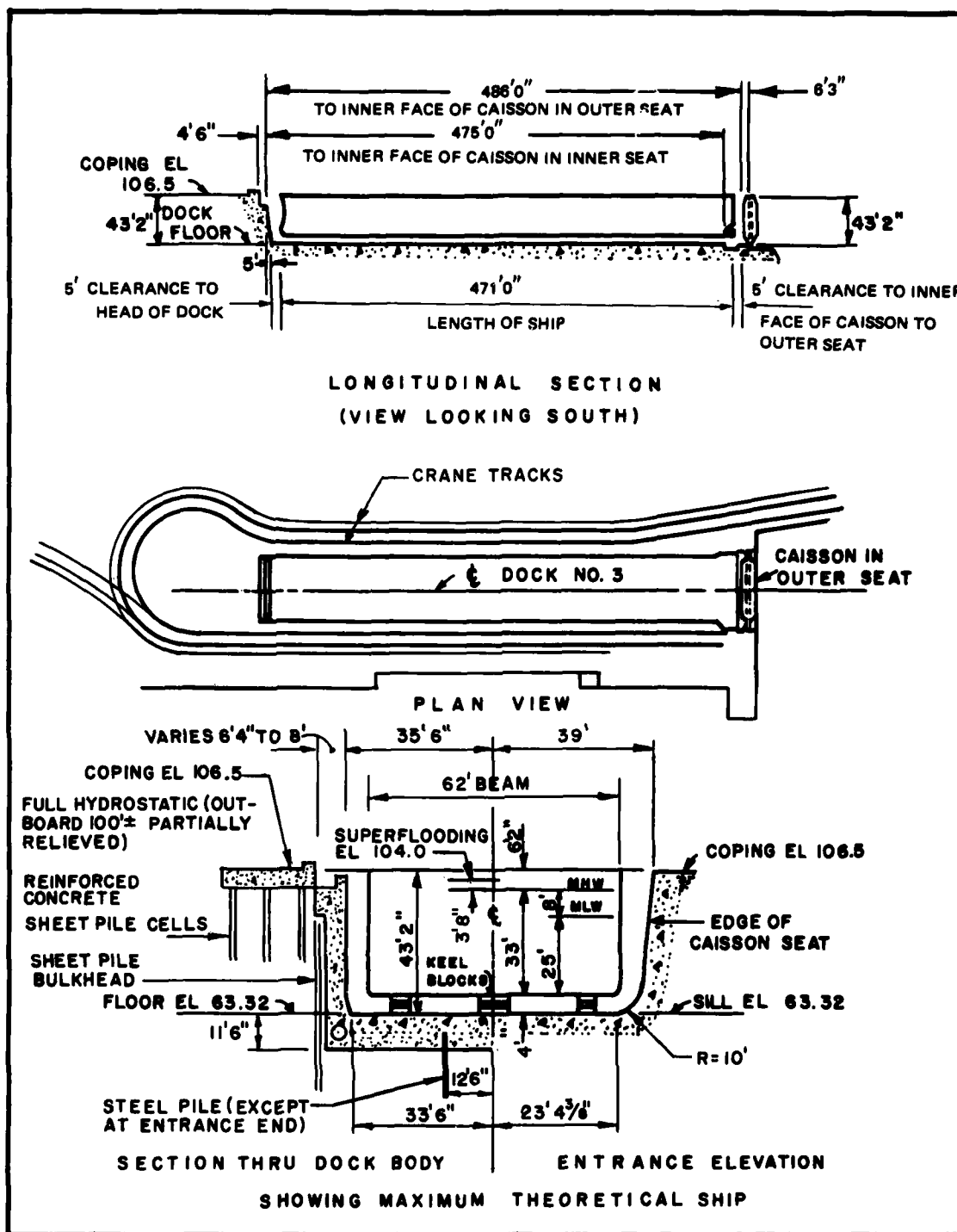


FIGURE 57
Portsmouth Naval Shipyard Drydock No. 3

Date Completed	Suitable for Docking	Foundation	Construction Material
1962	SSBN	Rock or piles	Concrete
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Two 36", 300 hp, 60,000 gpm. Time to dewater: 185 min.		
Drainage pumps	Two 8", 40 hp, 3,000 gpm.		
Flooding	Through culverts. Time to flood: 120 min. Super-flooding pumps: two 24", 50 hp, 20,000 gpm.		
Capstans	5 total: 1 at head, 30 fpm at 24k; 1 south side of entrance, 1 north side and 2 south side, 30 fpm at 12k. 1 winch; north side of entrance, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	124'6"	
Auxiliary ..	15 lg tons	148'11"	
Whip	5 lg tons	144'10", 65'6" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	8,400	1 no., 2,200a; 1 so., 4,000a.
Ac, 3 Ph, 60 Hz ..	460	3,000	2 no., 6 so., 400a; 1 no., 800a.
Dc	375	4,000	2 south side at 2,000 amps.
Fresh water	4" south and 6" north side mains, 400 gpm at 65 psi, five 2-1/2" outlets north side, ten 2-1/2" outlets south side. 4" headers at dock floor with outlets.		
Pure water	Two 1-1/2" south side mains, 60 psi, twelve outlets.		
Salt water	6" and 8" main, 2,500 gpm at 90 psi, ten 2-1/2" outlets north side. 4" headers at dock floor with outlets.		
Fire protection ...	Same as salt water and fresh water.		
Low pressure air ..	4" north and 6" south side mains, 100 psi, nine 2" outlets north side, seven 2-1/2" and two 2" outlets south side. 4" headers at dock floor with outlets.		
High pressure air .	1" main, 4,500 psi, four 1/2" outlets south side.		
Low pressure	2" north and 6" south side mains, 7,400 phr at 100 psi, ten 1-1/2" outlets north side, one 4", eight 2-1/2" and one 1-1/2" outlets south side.		
steam			
High pres. steam ..	6" main, 600 psi, one 6" outlet south side.		
Oxygen	1-1/2" mains, 110 psi, five 3/4" outlets each side.		
Sanitary sewer	4" south side main, 200 gpm, one 4" inlet.		
MAPP gas	1-1/2" mains, 15 psi, five 3/4" outlets each side.		

FIGURE 57 (Continued)
Portsmouth Naval Shipyard Drydock No. 3

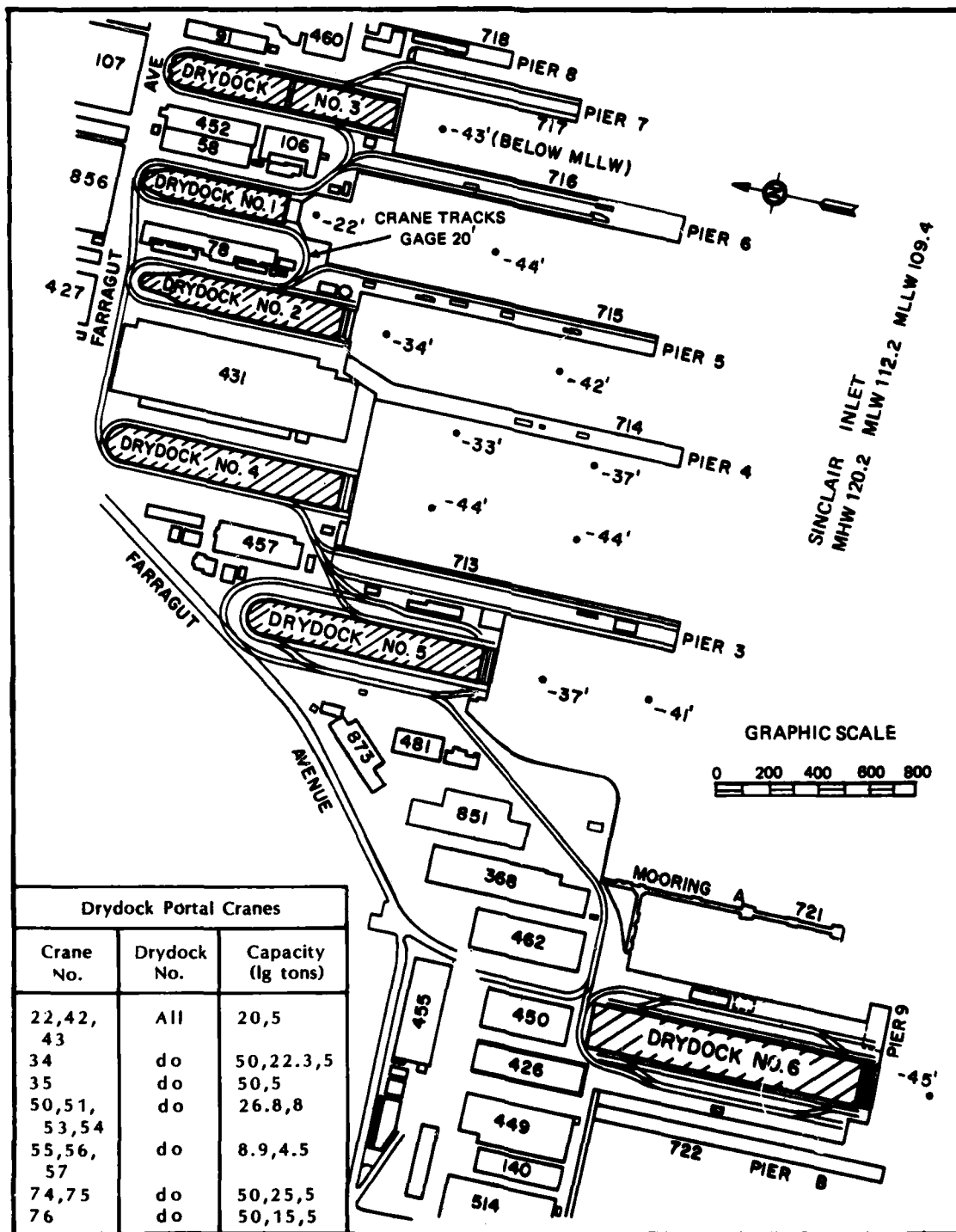


FIGURE 58
Location of Drydocks, Puget Sound Naval Shipyard, Bremerton, Washington

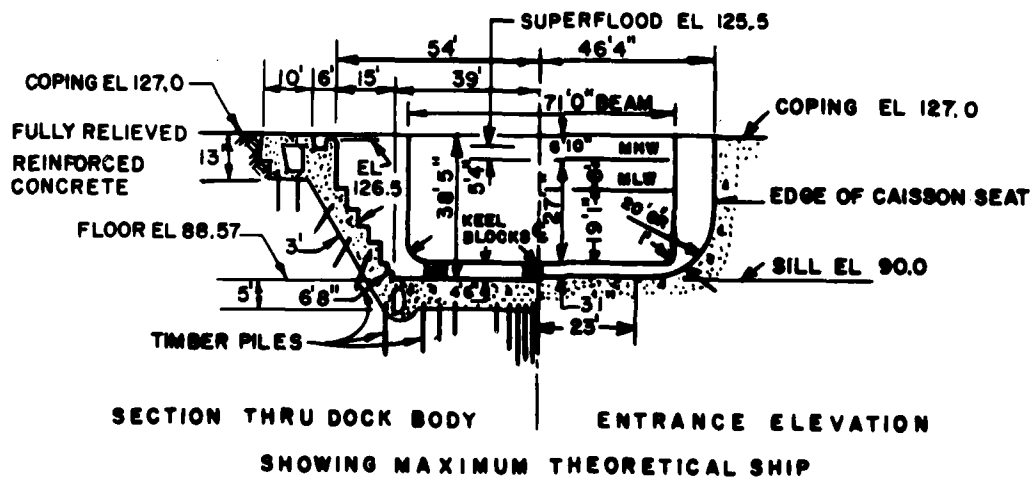
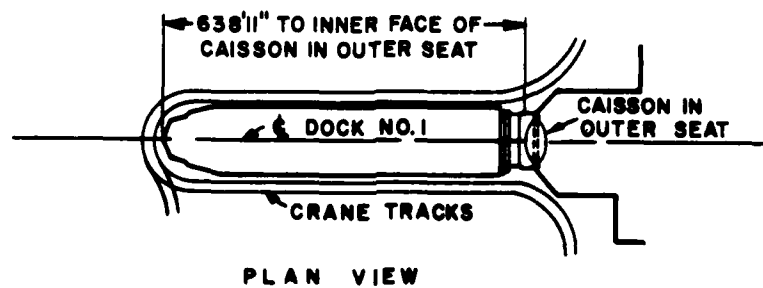
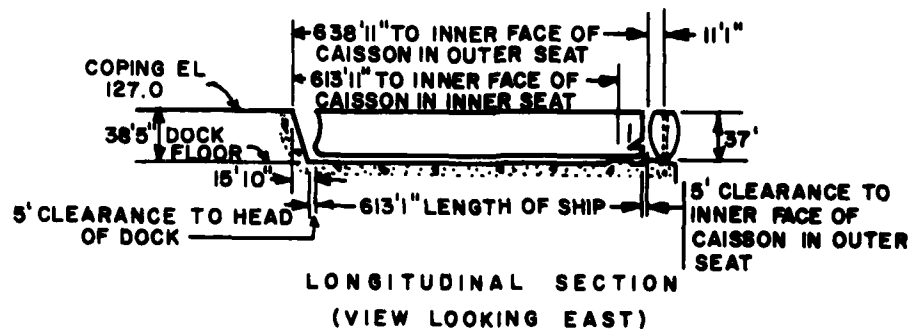


FIGURE 59
Puget Sound Naval Shipyard Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1931	CG, SSBN	Piles	Concrete
Closure	Caisson, steel (ship type).		
Dewatering pumps ..	Four 54", 550 hp, 320,000 gpm (Drydock No. 2 pump-house). Time to dewater: 90 min.		
Drainage pumps	Two 15", 85 hp, 9,750 gpm (Drydock No. 2 pumphouse). Drydock No. 4 or 5 drainage pumps normally used.		
Flooding	Through caisson. Time to flood: 105 min. Super-flooding pumps: two 36", 75 hp, 30,000 gpm.		
Capstans	6 total: 1 at head, 1 each side of entrance, 1 east side, 1 west side, 30 fpm at 12k; 1 west side, 30 fpm at 24k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	118'9"	
Auxiliary ..	15 lg tons	145'0"	
Whip	5 lg tons	220'0", 108'3" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	4,800	2 west side at 2,400 amps.
Ac, 3 Ph, 60 Hz ..	460	1,600	1 west side at 1,600 amps.
Ac, 3 Ph, 60 Hz ..	460	1,200	2 west side at 1,200 amps.
Fresh water	4" mains, 500 gpm at 80 psi, eight 2-1/2" outlets east side, ten 2-1/2" outlets west side.		
Pure water	1-1/2" main, 50 gpm at 62 psi, two 1-1/2" outlets west side.		
Salt water	8" east and 12" west side mains, 4,200 gpm at 125 psi, thirteen 4" outlets each side, six 2-1/2" outlets east side, four 2-1/2" outlets west side.		
Fire protection ...	Same as salt water.		
Compressed air	3-1/2" mains, 4,000 cfm at 80 psi, eight 2" outlets each side. 2" headers at dock floor with outlets.		
Steam	2-1/2" east, 2-1/2" and 3" west side mains, 20,000 phr at 80 psi, eight 2" outlets each side.		
Oxygen	2" mains, 1,100 cfm at 100 psi, six 1" outlets east side, five 1" outlets west side.		
Sanitary sewer	8" mains, 300 gpm, ten 4" inlets each side.		

FIGURE 59 (Continued)
Puget Sound Naval Shipyard Drydock No. 1

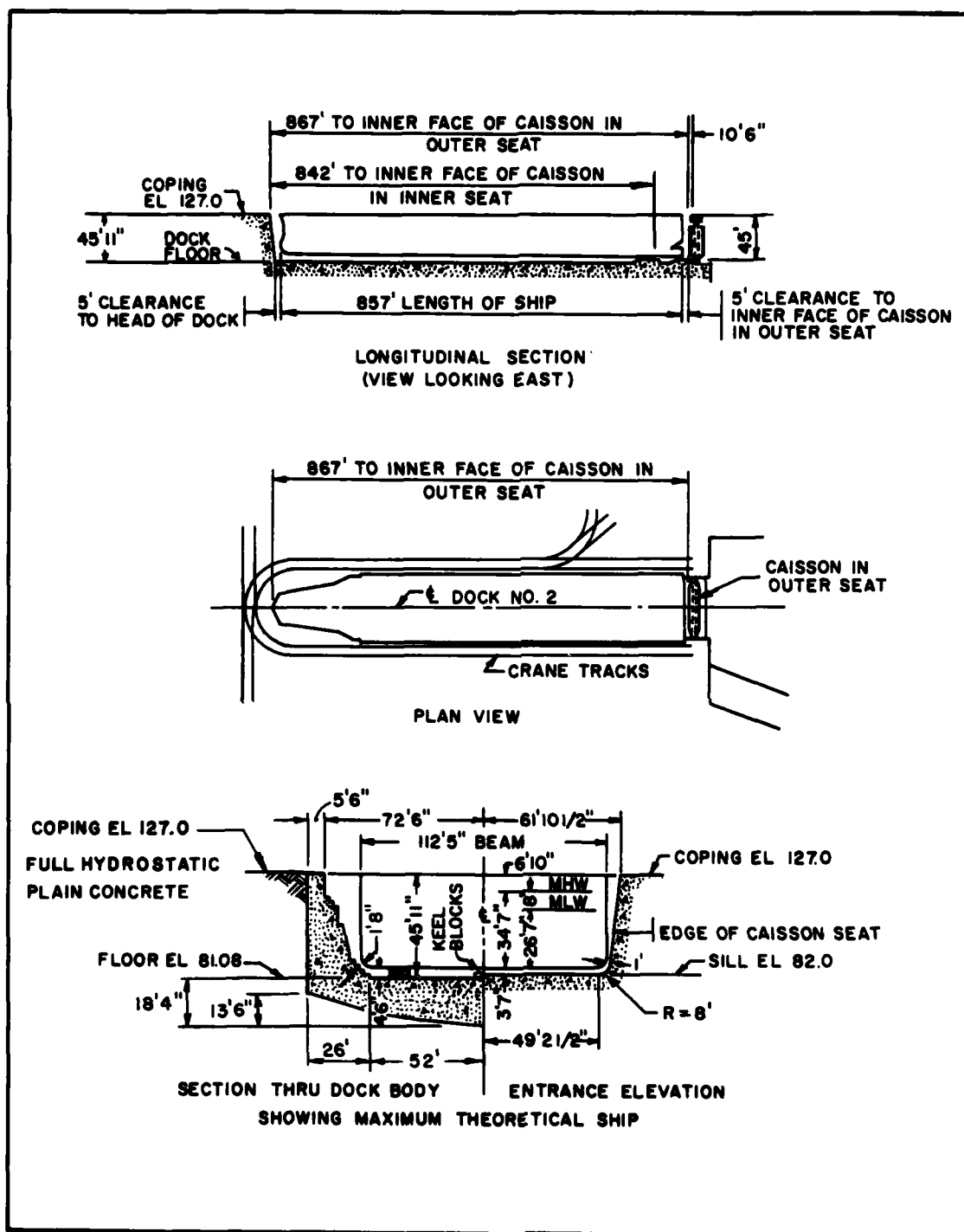


FIGURE 60
 Puget Sound Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1911	CVA, CVS, SSBN	Earth	Granite and concrete
Item	Data		
Closure	Caisson, steel (hydrometer type).		
Dewatering pumps ..	Four 54", 550 hp, 320,000 gpm. Pumps also used for Drydock No. 1 and 3. Time to dewater: 165 min.		
Drainage pumps	Two 15", 85 hp, 9,750 gpm (Drydock No. 2 pumphouse). Drydock No. 4 or 5 drainage pumps normally used.		
Flooding	Through caisson. Time to flood: 75 min.		
Capstans	8 total: 1 at head, 12 fpm at 35k; 1 each side of entrance, 3 east side, 2 west side, 12 fpm at 17k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	115'0"	
Auxiliary ..	15 lg tons	142'6"	
Whip	5 lg tons	220'0", 108'3" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	4,800	2 west side at 2,400 amps.
Ac, 3 Ph, 60 Hz ..	460	2,400	1 west side at 2,400 amps.
Ac, 3 Ph, 60 Hz ..	460	1,600	2 east side at 1,600 amps.
Fresh water	8" mains, 3,000 gpm at 80 psi, fourteen 2-1/2" outlets east side, twelve 2-1/2" outlets west side.		
Pure water	1-1/2" main, 50 gpm at 55 psi, one 1-1/2" outlet west side.		
Salt water	12" mains, 7,000 gpm at 125 psi, twenty-four 4" outlets each side, two 2-1/2" outlets west side.		
Fire protection ...	Same as salt water.		
Compressed air	4" and 6" east and 6" west side mains, 9,000 cfm at 80 psi, two 2", six 1-1/2" and three 1-1/4" outlets east side, twenty-four 1-1/2" outlets west side. 2" headers at dock floor with outlets.		
Steam	6" mains, 30,000 phr at 80 psi, eleven 2" outlets each side, one 1-1/2" and one 3/4" outlet west side.		
Oxygen	2-1/2" mains, 1,300 cfm at 100 psi, six 1" outlets each side.		
Sanitary sewer	8" mains, 300 gpm, thirty-five 6" inlets each side.		

FIGURE 60 (Continued)
Puget Sound Naval Shipyard Drydock No. 2

Date Completed	Suitable for Docking	Foundation	Construction Material
1919	DD, SS	Earth	Concrete
Closure	Caisson, steel (hydrometer type). Removable intermediate bulkhead, steel and timber.		
Dewatering pumps ..	Four 54", 550 hp, 320,000 gpm (Dock No. 2 pumphouse). Time to dewater: 90 min, south section; 165 min, total.		
Drainage pumps	Two 8", 50 hp, 4,000 gpm (Pumphouse 3A-North); two 14", 75 hp, 9,000 gpm (Pumphouse 3-South). Drydock No. 4 or 5 drainage pumps normally used.		
Flooding	Through culverts. Time to flood: 60 min, south section; 120 min, total dock.		
Capstans	4 total: 1 each side of entrance, 1 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	116'9"	
Auxiliary ..	15 lg tons	144'3"	
Whip	5 lg tons	220'0", 108'3" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	1,200	2 east side at 600 amps.
Ac, 3 Ph, 60 Hz ..	460	800	2 west side at 800 amps.
Ac, 3 Ph, 60 Hz ..	460	800	2 east side at 400 amps.
Fresh water	4" west and 6" east side mains, 500 gpm at 80 psi, nine 2-1/2" outlets each side.		
Salt water	10" mains, 4,200 gpm at 125 psi, seven 4" and two 2-1/2" outlets east side, nine 4" outlets west side.		
Fire protection ...	Same as salt water.		
Compressed air	6" west and 8" east side mains, 10,000 cfm at 80 psi, twenty-one 1-1/4" outlets east side, twenty-three 1-1/4" and two 1" outlets west side. 1-1/2" headers at dock floor with outlets.		
Steam	3" main, 18,000 phr at 80 psi, one 2-1/2" and four 1" outlets west side.		
Oxygen	2" mains, 1,100 cfm at 100 psi, nine 1" outlets each side.		
Sanitary sewer	6" mains north section, nine 6" inlets each side; 8" mains south section, twelve 6" inlets east side and twenty-four 6" inlets west side; 400 gpm.		

FIGURE 61 (Continued)
Puget Sound Naval Shipyard Drydock No. 3

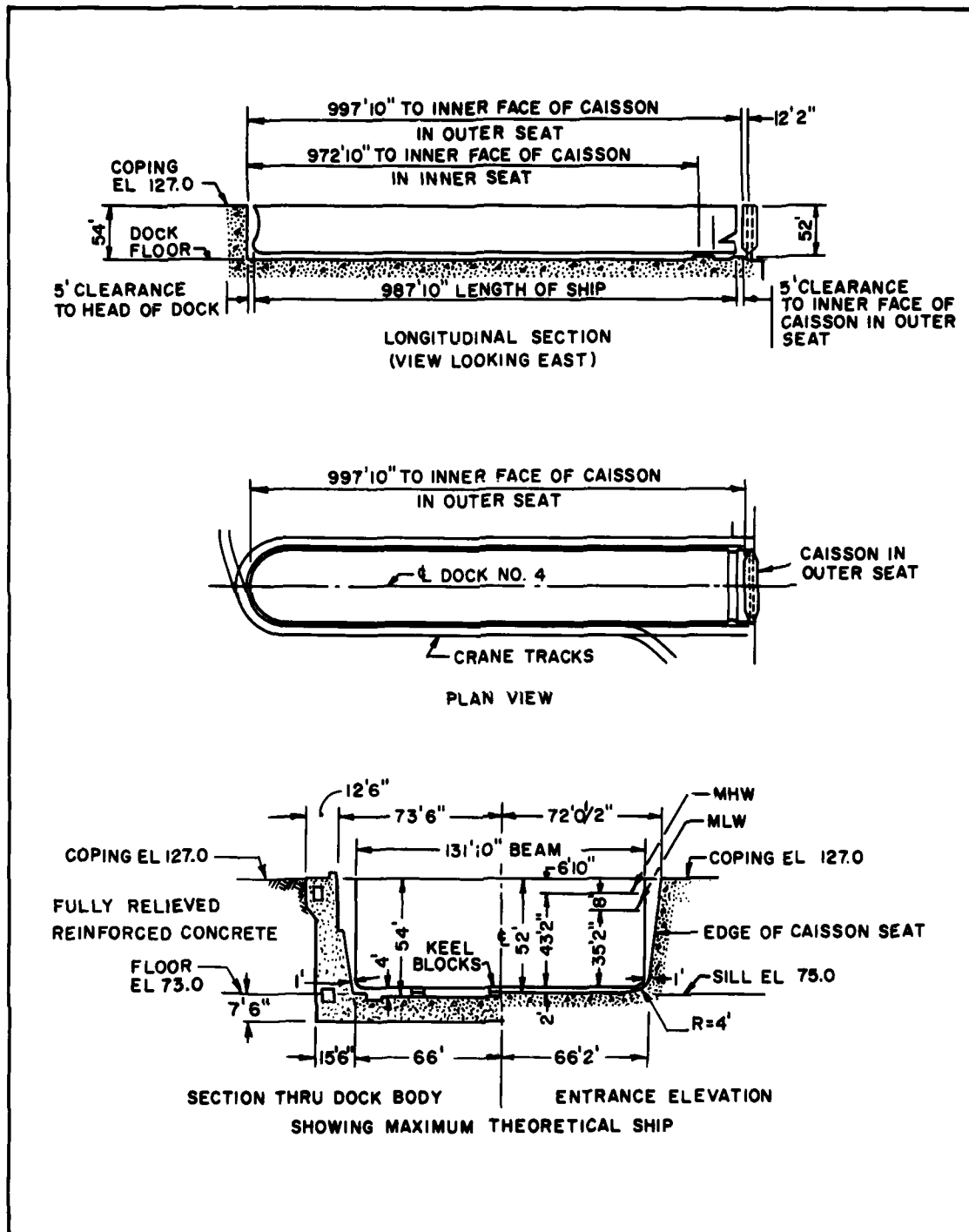


FIGURE 62
Puget Sound Naval Shipyard Drydock No. 4

Date Completed	Suitable for Docking	Foundation	Construction Material
1940	CV	Earth	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type). Spare caisson, steel (rect. box type), also used for Drydock No. 5.		
Dewatering pumps ..	Three 54", 1,200 hp, 390,000 gpm. Time to dewater: 195 min.		
Drainage pumps	Two 16", 250 hp, 14,400 gpm.		
Flooding	Through culverts and caisson. Time to flood: 90 min.		
Capstans	13 total: 1 at head, 1 each side of entrance, 30 fpm at 24k; 2 each side, 10 fpm at 50k; 4 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	113'6"	
Auxiliary ..	15 lg tons	141'6"	
Whip	5 lg tons	220'0", 108'3" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	4,800	2 east side at 2,400 amps.
Ac, 3 Ph, 60 Hz ..	460	2,400	2 east side at 2,000 amps; 2 east side at 1,200 amps; 1 east side at 800 amps; 1 east side at 400 amps.
Fresh water	6" east and 8" west side mains, 2,200 gpm at 80 psi, ten 2-1/2" outlets each side.		
Pure water	3" main, 50 gpm at 84 psi, one 1-1/2" outlet west side.		
Salt water	12" mains, 7,000 gpm at 125 psi, twenty-four 4" and four 2-1/2" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 8,000 cfm at 80 psi, twenty-four 1-1/4" outlets each side. 2-1/2" headers at dock floor with outlets.		
Steam	6" east and 8" west side mains, 50,000 phr at 80 psi, twelve 2-1/2" outlets each side.		
Oxygen	2" east and 3" west side mains, 1,350 cfm at 100 psi, six 1" outlets each side.		
Sanitary sewer	8" mains, 400 gpm, twenty-four 4" inlets each side.		

FIGURE 62 (Continued)
Puget Sound Naval Shipyard Drydock No. 4

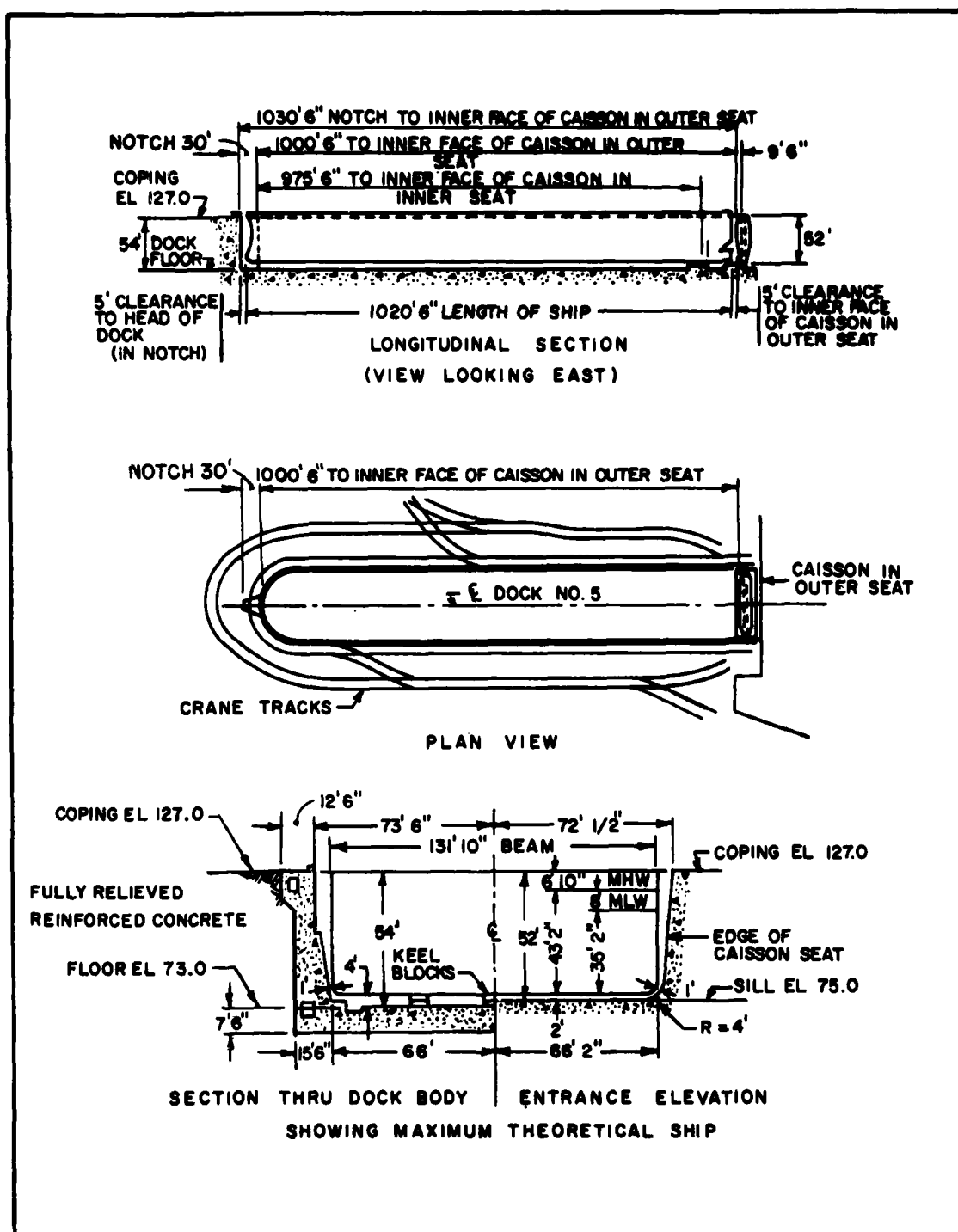


FIGURE 63
 Puget Sound Naval Shipyard Drydock No. 5

Date Completed	Suitable for Docking	Foundation	Construction Material
1941	CV	Earth	Concrete
Closure	Caisson, steel (rectangular box type). Spare caisson, steel, (rect. box type), also used for Drydock No. 4.		
Dewatering pumps ..	Three 54", 1,200 hp, 390,000 gpm. Time to dewater: 195 min.		
Drainage pumps	Two 16", 250 hp, 13,000 gpm.		
Flooding	Through culverts. Time to flood: 90 min.		
Capstans	13 total: 1 at head, 1 each side of entrance, 30 fpm at 24k; 5 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	113'6"	
Auxiliary ..	15 lg tons	141'6"	
Whip	5 lg tons	220'0", 108'3" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	8,000	2 west side at 4,000 amps.
Ac, 3 Ph, 60 Hz ..	460	4,800	2 east side at 2,400 amps.
Ac, 3 Ph, 60 Hz ..	460	4,800	2 east side at 2,400 amps.
Ac, 3 Ph, 60 Hz ..	460	3,500	1 east side at 2,400 amps; 1 east side at 600 amps; 1 east side at 500 amps.
Fresh water	3", 4" and 6" mains, 1,500 gpm at 80 psi, six 2-1/2" outlets each side.		
Pure water	1-1/2" and 3" main, 75 gpm at 84 psi, three 1-1/2" outlets each side.		
Salt water	12" mains, 7,000 gpm at 125 psi, twenty-four 4" and four 2-1/2" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	3", 4" and 6" mains, 8,000 cfm at 80 psi, one 2" and twenty-five 1-1/4" outlets east side, twenty-four 1-1/4" outlets west side. 2-1/2" headers at dock floor with outlets.		
Steam	4", 6" east and 8" west side mains, 37,000 phr at 80 psi, twelve 2-1/2" outlets each side.		
Oxygen	2" west and 3" east side mains, 1,400 cfm at 100 psi, six 1" outlets each side.		
Sanitary sewer	8" mains, 400 gpm, twenty-five 4" inlets each side.		

FIGURE 63 (Continued)
Puget Sound Naval Shipyard Drydock No. 5

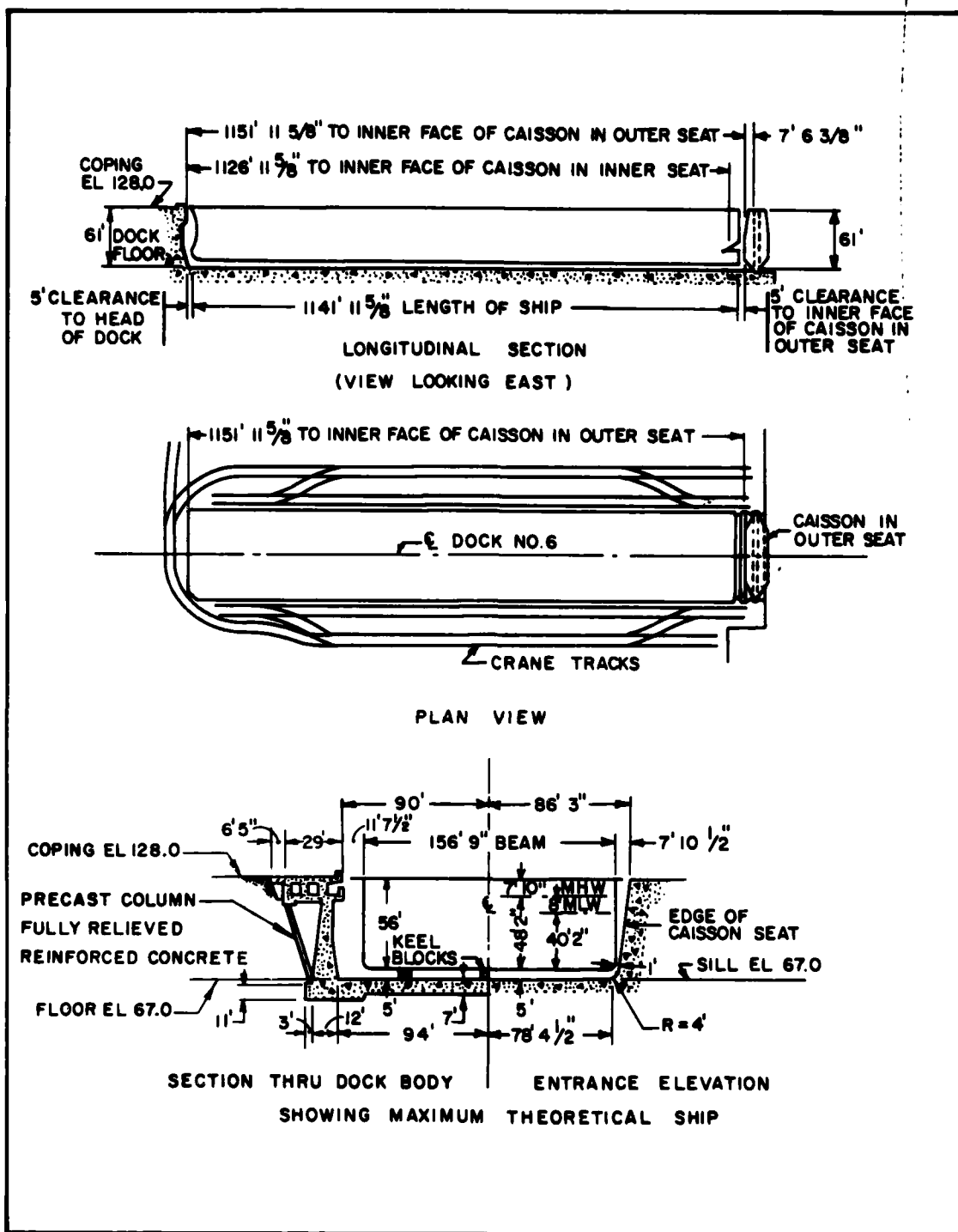


FIGURE 64
Puget Sound Naval Shipyard and Drydock No. 6

Date Completed	Suitable for Docking	Foundation	Construction Material
1962	CVN	Earth	Concrete
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Four 54", 1,500 hp, 456,000 gpm. Time to dewater: 230 min.		
Drainage pumps	Three 20", 400 hp, 45,000 gpm.		
Flooding	Through culverts. Time to flood: 90 min.		
Capstans	11 total: 1 at head, 1 each side of entrance, 30 fpm at 30k; 4 each side, 30 fpm at 15k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	50 lg tons	97'0"	
Auxiliary ..	15 lg tons	129'6"	
Whip	5 lg tons	220'0", 108'3" min radius	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	4,160	3,000	2 east side at 1,500 amps.
Ac, 3 Ph, 60 Hz ..	460	8,000	2 east side at 4,000 amps.
Ac, 3 Ph, 60 Hz ..	460	5,600	4 east side at 800 amps; 4 west side at 600 amps.
Ac, 3 Ph, 60 Hz ..	460	4,800	2 west side at 2,400 amps.
Ac, 3 Ph, 60 Hz ..	460	4,000	1 east side at 4,000 amps.
Ac, 3 Ph, 60 Hz ..	460	3,200	2 east side at 1,600 amps.
Fresh water	6" mains, 1,600 gpm at 80 psi, twenty-one 2-1/2" outlets east side, fourteen 2-1/2" outlets west side.		
Pure water	2" and 3" main, 75 gpm at 80 psi, two 1-1/2" outlets west side.		
Salt water	10" west, 10" and 20" east side mains, 12,000 gpm at 125 psi, nineteen 4" and seven 2-1/2" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 10,000 cfm at 80 psi, fifty-six 1-1/4" outlets each side. 3" headers at dock floor with outlets.		
Steam	6" and 12" mains, 80,000 phr at 150 psi, fourteen 2-1/2" outlets each side.		
Oxygen	3" mains, 1,650 cfm at 100 psi, seven 1" outlets each side.		
Sanitary sewer	10" east side main, 300 gpm, thirty 4" inlets each side.		

FIGURE 64 (Continued)
Puget Sound Naval Shipyard and Drydock No. 6

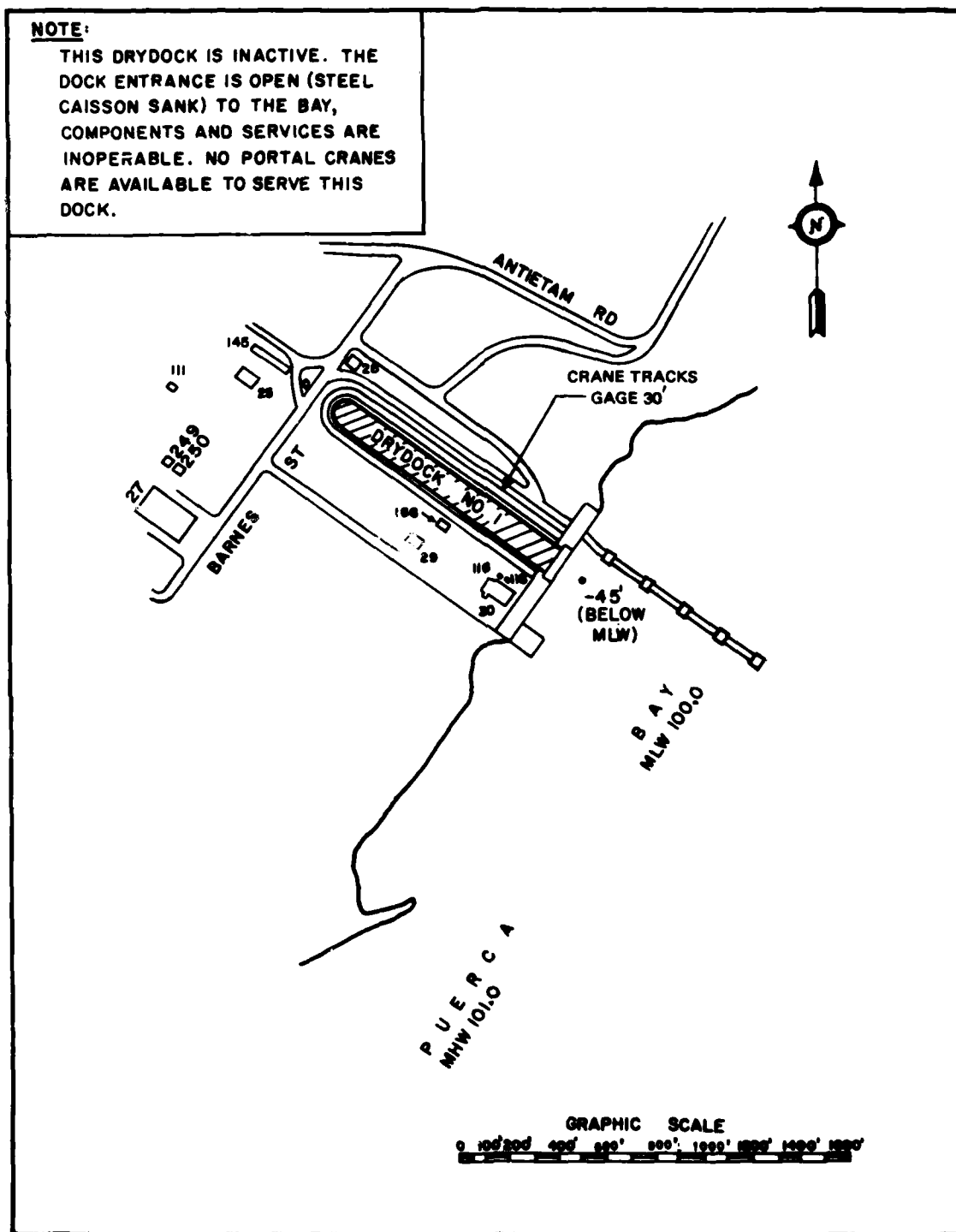


FIGURE 65
Location of Drydock, Roosevelt Roads Naval Station, Vieques, Puerto Rico

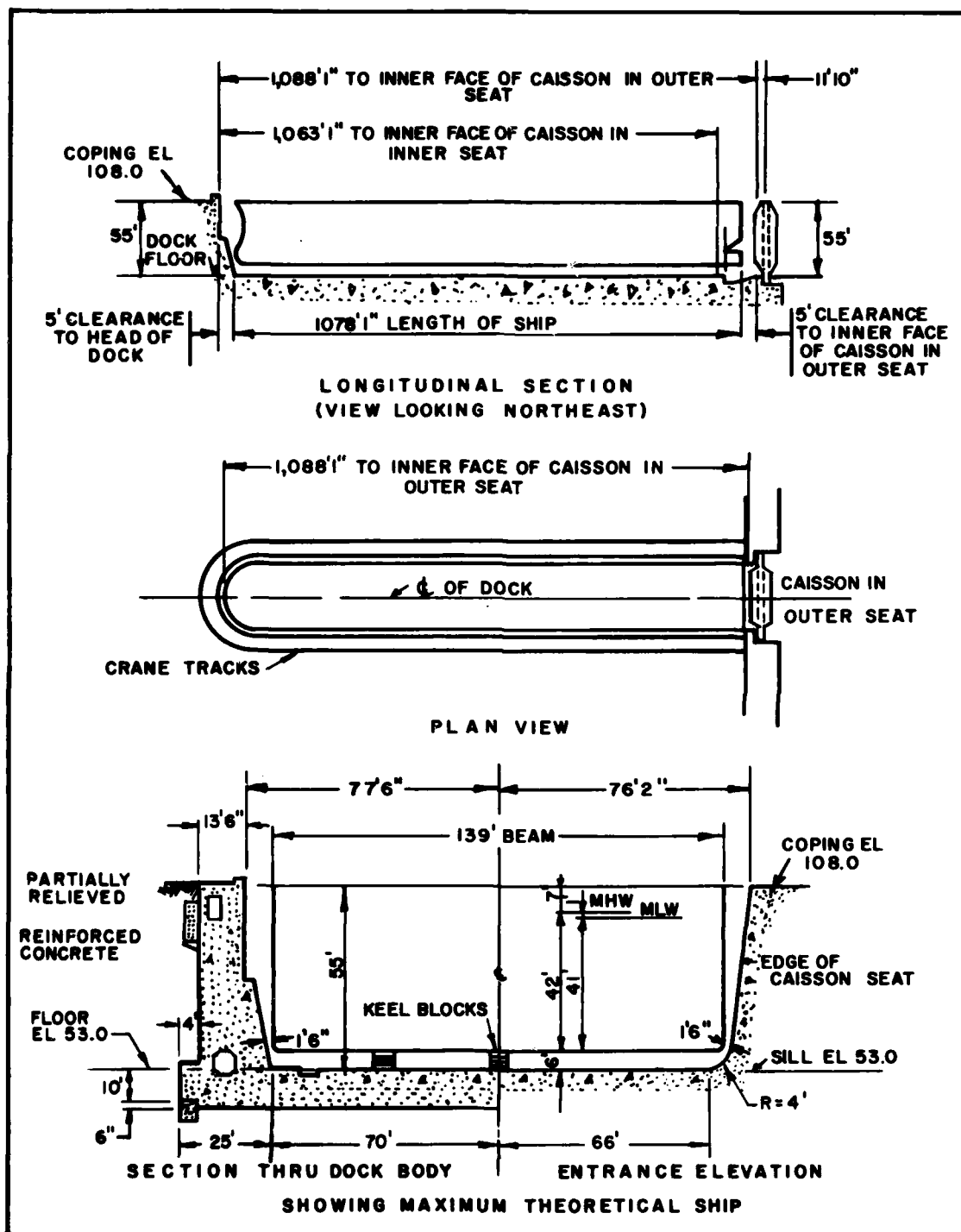


FIGURE 66
Roosevelt Roads Naval Station Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1944	INACTIVE	Earth	Concrete
Item	Data (INOPERABLE)		
Closure	Caisson, steel (rectangular box type). Spare caisson, reinforced concrete (rectangular box type).		
Dewatering pumps ..	Four 54", 1,250 hp, 368,000 gpm. Time to dewater: 165 min.		
Drainage pumps	Two 16", 250 hp, 12,000 gpm.		
Flooding	Through culverts. Time to flood: 180 min.		
Capstans	13 total: 1 at head, 1 each side of entrance, 30 fpm at 24k; 5 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
No Portal Cranes Available to Serve this Dock			
Ship and Industrial Services Furnished at Dock (INOPERABLE)			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	3,000	6 north side and 2 south side, 400 amp panel.
Ac, 3 Ph, 60 Hz ..	460	3,000	3 south side, 1,600 amp panel.
Item	Data		
Fresh water	6" mains, 580 gpm at 125 psi, six 2" outlets north side, five 2-1/2" and five 2" outlets south side.		
Salt water	8" mains, 1,800 gpm at 125 psi, six 2-1/2" outlets north side, five 2-1/2" outlets south side.		
Fire protection ...	8" mains, 1,800 gpm at 125 psi, five 6" outlets north side, eight 6" outlets south side.		
Compressed air	6" mains, 6,000 cfm at 100 psi, six 2-1/2" outlets north side, five 2-1/2" outlets south side.		
Steam	6" mains, 24,000 phr at 120 psi, six 2-1/2" and six 2" outlets north side, five 2-1/2" and five 2" outlets south side.		
Sanitary sewer	8" mains, twenty-seven 4" inlets each side.		

FIGURE 66 (Continued)
Roosevelt Roads Naval Station Drydock No. 1

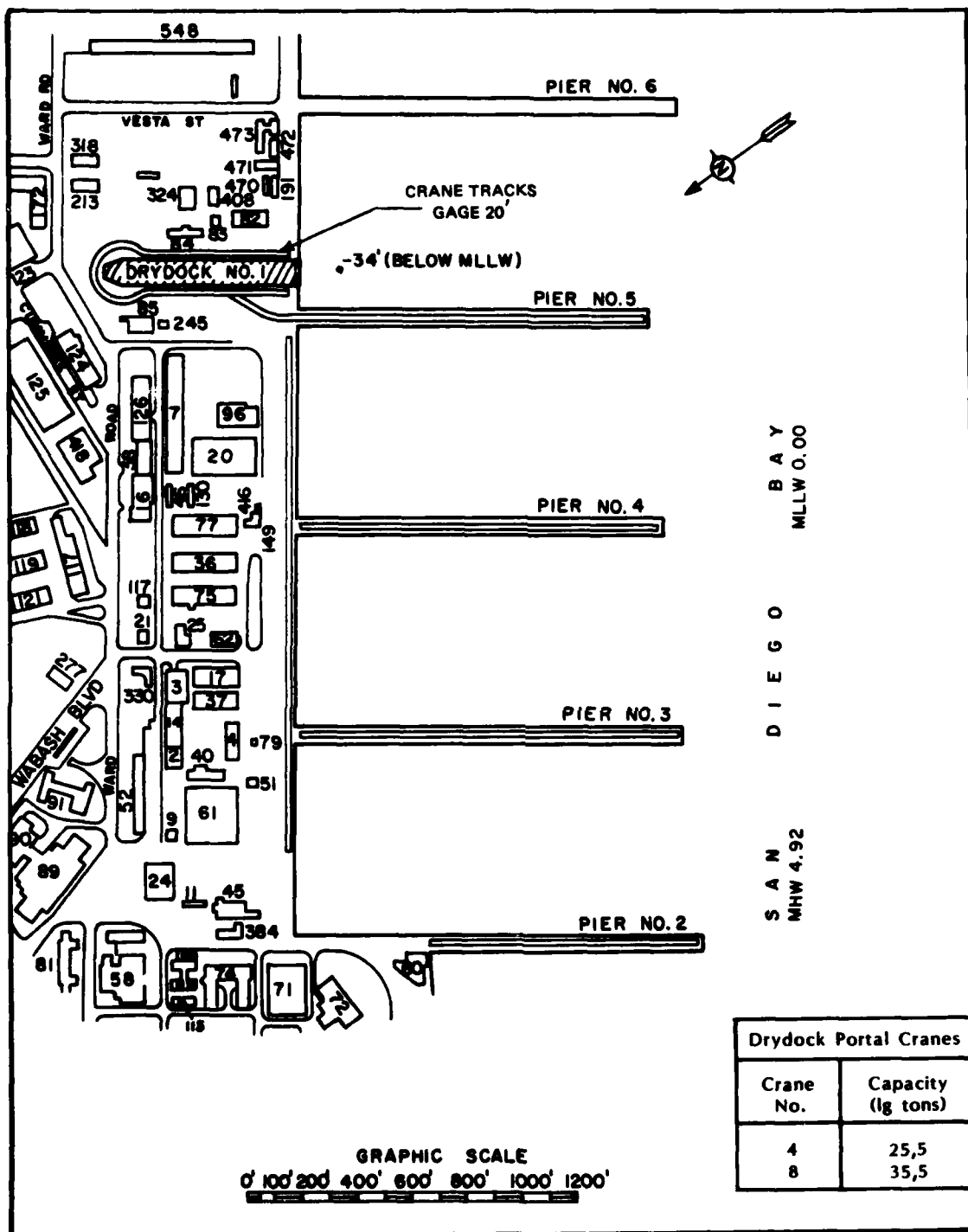


FIGURE 67
Location of Drydock, San Diego Naval Station, San Diego, California

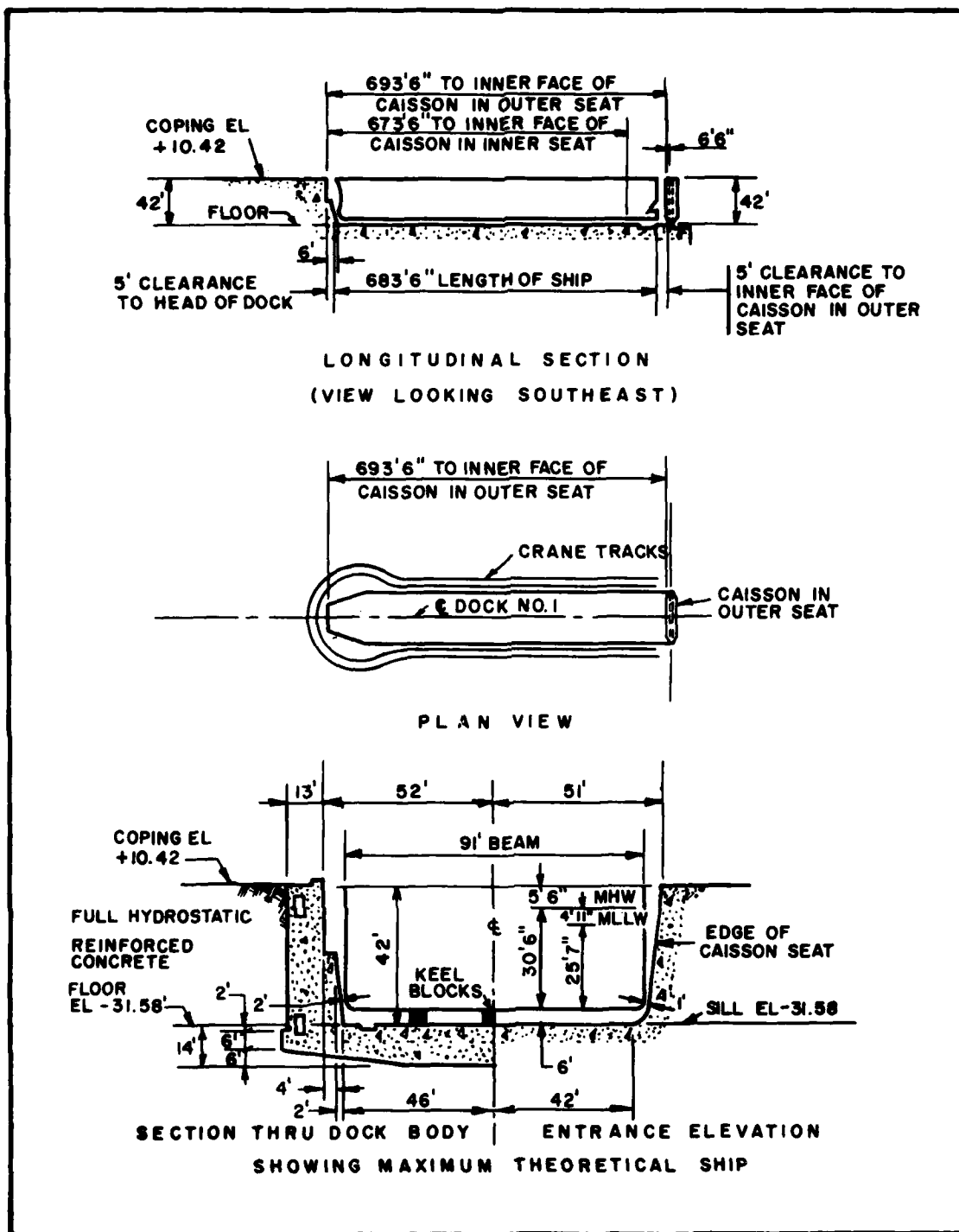


FIGURE 68
San Diego Naval Station Drydock No. 1

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	CG	Earth	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Two 54", 800 hp, 220,000 gpm. Time to dewater: 130 min.		
Drainage pumps	Two 16", 200 hp, 14,000 gpm.		
Flooding	Through culverts. Time to flood: 60 min.		
Capstans	7 total: 1 at head, 1 each side of entrance, 30 fpm at 36k; 2 each side, 30 fpm at 12k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	35 lg tons	85'0"	
Auxiliary ..	5 lg tons	100'0"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	2,600	6 north side and 4 south side at 400 amps; 1 each side of entrance at 100 amps.
Ac, 3 Ph, 60 Hz ..	115/230	1,600	4 each side.
Item	Data		
Fresh water	8" north and 12" south side mains, 1,500 gpm at 90 psi, five 2-1/2" outlets each side.		
Salt water	10" mains, 3,500 gpm at 105 psi, eight 2-1/2" outlets each side.		
Fire protection ...	Same as salt water.		
Compressed air	6" mains, 7,500 cfm at 100 psi, five 2-1/2" outlets each side.		
Steam	6" mains, 30,000 phr at 130 psi, five 2-1/2" outlets each side.		
Sanitary Sewer	8" mains, 900 gpm, thirty 6" inlets each side.		
Natural gas	1" main, 33 cfm at 10 psi, one 1" outlet north side.		

FIGURE 68 (Continued)
San Diego Naval Station Drydock No. 1

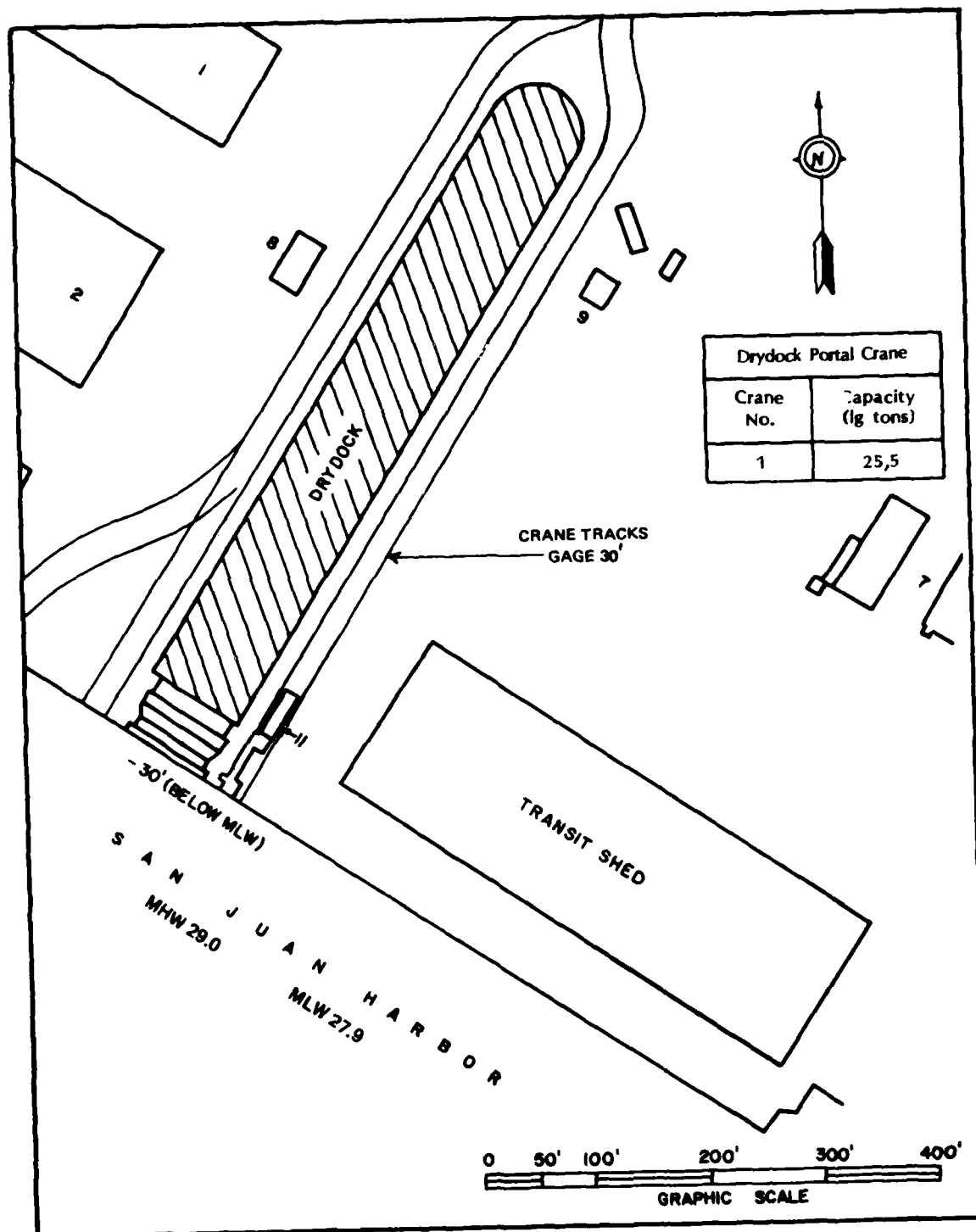


FIGURE 69
Location of Drydock, Naval Drydock and Repair Facility, San Juan,
Puerto Rico

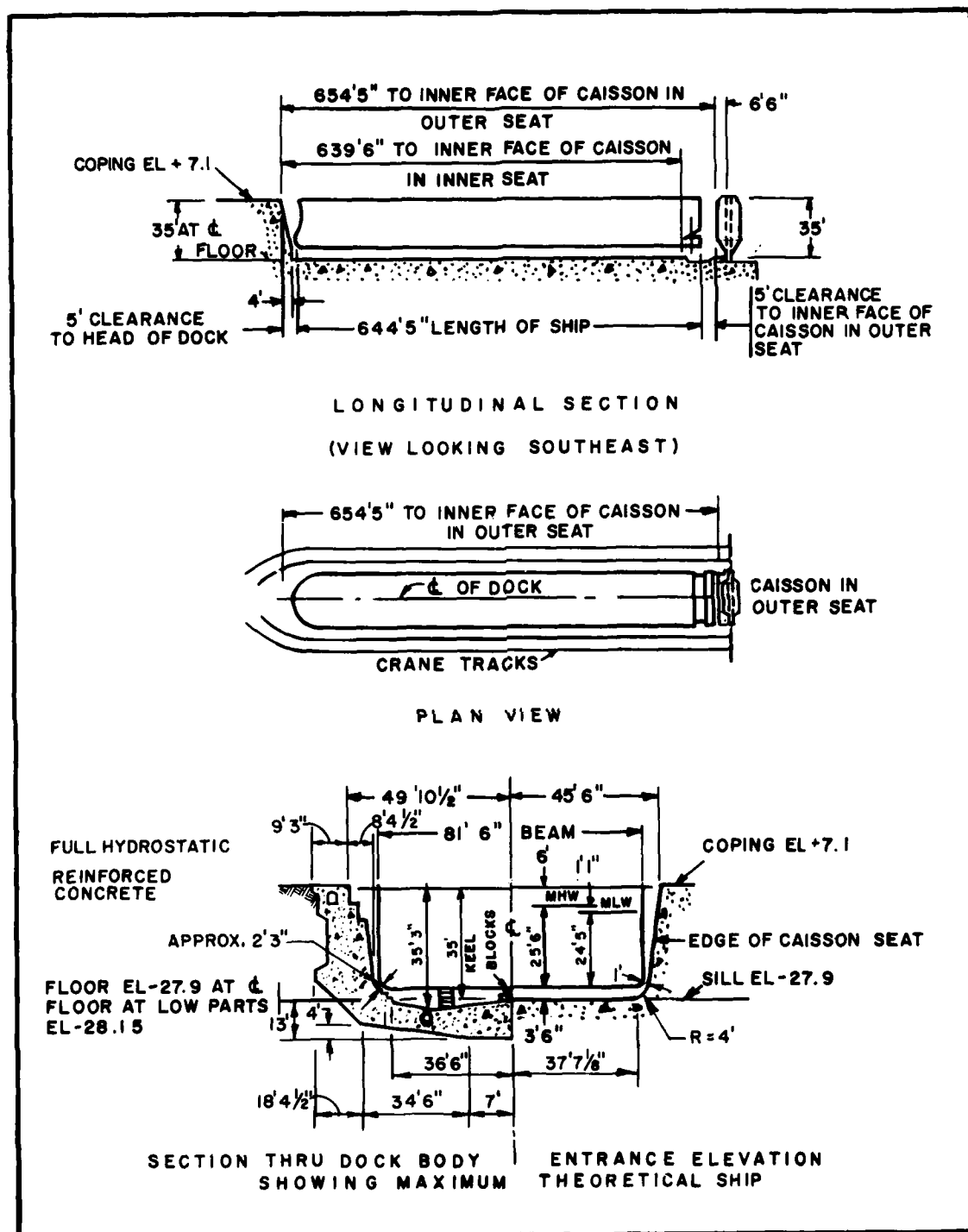


FIGURE 70
San Juan Naval Drydock and Repair Facility

Date Completed	Suitable for Docking	Foundation	Construction Material
1942	CG, AO	Earth	Concrete
Item	Data		
Closure	Caisson, steel (rectangular box type).		
Dewatering pumps ..	Three 36", 200 hp, 96,000 gpm. Time to dewater: 165 min.		
Drainage pumps	Two 10", 60 hp, 10,000 gpm.		
Flooding	Through culverts. Time to flood: 75 min.		
Capstans	5 total: 1 at head, 1 each side of entrance, 1 each side, 25 fpm at 5.5k.		
Portal Crane Maximum Capacities and Heights			
Hook	5 ft beyond dock centerline	Max height above coping with hook at dock centerline	
Main	25 lg tons	75'0"	
Auxiliary ..	5 lg tons	95'0"	
Ship and Industrial Services Furnished at Dock			
Electrical	Volts	Amp	Receptacles
Ac, 3 Ph, 60 Hz ..	460	1,000	2 north side
Ac, 3 Ph, 60 Hz ..	220	600	2 north side and 3 south side
Item	Data		
Fresh water	6" mains, 50 psi, four 1-1/2" outlets each side.		
Salt water	14" mains, 1,500 gpm at 125 psi, five 4" and five 2-1/2" outlets each side.		
Fire protection ...	Same as salt water.		

Figure 70 (Continued)
San Juan Naval Drydock and Repair Facility

REFERENCES

(Publications containing criteria cited in this manual)

NAVFACENGCOM Design Manuals

Government agencies may obtain Design Manuals from the U.S. Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120. TWX 710-670-1685, AUTOVON: 442-3321. The stock number is necessary for ordering these documents and should be requested from the NAVFACENGCOM Division in your area.

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DM-29.1 Graving Drydocks

DM-29.2 Marine Railways

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